

# TC-K333ESL/K970ES

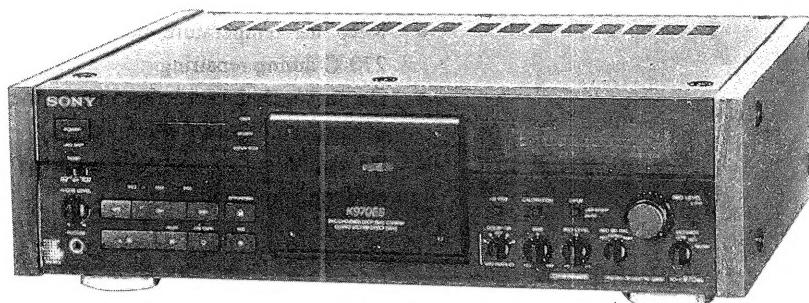
## SERVICE MANUAL

AEP Model

TC-K970ES

E Model

TC-K333ESL



\* Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"DOLBY", the double-D symbol and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	TC-K333ESG
Tape Transport Mechanism Type	TCM-200D4

### SPECIFICATIONS

Recording system	4-track 2-channel stereo
Fast winding time	Approx. 90 sec. (with Sony C-60 cassette)
Bias	AC bias
Heads	Erasing head × 1 (S&F head) Recording head × 1 (LA head) Playback head × 1 (LA head)
Motors	Capstan motor × 1 (direct-drive linear torque BSL motor) Reel motor × 1 (DC motor) DC motor × 1

#### Signal-to-noise ratio (at peak level)

Dolby NR switch	OFF	B-Type ON	C-Type ON
Cassette			
Type IV (Sony METAL-S)	61 dB	70 dB	76 dB
Type II (Sony UX-S)	59 dB	68 dB	74 dB
Type I (Sony HF-S)	57 dB	66 dB	72 dB

Total harmonic distortion 1.0% (with Sony METAL-S cassettes)

Frequency response (DOLBY NR OFF)

Type IV cassette (Sony METAL-S)	15 - 22,000 Hz ( $\pm 3$ dB, IEC) 15 - 16,000 Hz [ $\pm 3$ dB OVU(-4dB)recording]
Type II cassette (Sony UX-S)	15 - 20,000 Hz ( $\pm 3$ dB, IEC)
Type I cassette (Sony HF-S)	15 - 18,000 Hz ( $\pm 3$ dB, IEC)

Wow and flutter

$\pm 0.04\%$  W.Peak (IEC)  
 $0.024\%$  WRMS (NAB)  
 $\pm 0.065\%$  W.Peak (DIN)

#### Inputs

Line inputs (phono jacks)	Sensitivity	77.5 mV
CD DIRECT INPUT	Input impedance	47 k ohms
CD DIRECT INPUT	Input impedance	47 k ohms

#### Outputs

Line outputs (phono jacks)	Rated output level	0.44 V at a load impedance of 47 k ohms
Phones (stereo phone jack)	Load impedance	Over 10 k ohms
Phones (stereo phone jack)	Output level	0 - 2.5 mW at a load impedance of 32 ohms

#### General

Power requirements 120-220-240V AC, 50/60Hz (AEP, Germany)  
220-230V AC, 50/60Hz (E)

Dimensions 31 W

Approx. 470 × 140 × 380 mm (w/h/d)  
(18½ × 5⅝ × 15 inches)

including projecting parts and controls

Approx. 12.0 kg (17 lbs 7 oz)

Model for other countries: Approx. 11.2 kg

Audio connecting cord (2)

Screws(8)

Wireless remote control unit\*

Sony R6 (Size-AA) batteries (2)\*

\* Not supplied with model for AEP countries

Design and specifications subject to change without notice.

STEREO CASSETTE DECK  
**SONY**<sup>®</sup>



## TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
SPECIFICATIONS.....		1
MODEL IDENTIFICATION .....		3
1. GENERAL .....		4
2. DISASSEMBLY .....		8
3. ADJUSTMENTS		
3-1. Mechanical Adjustments .....		10
3-2. Electrical Adjustments .....		12
4. DIAGRAMS		
4-1-1. IC502, 505 (CX20188) Pin Functions .....		17
4-1-2. IC601 (M50940-313SP) Pin Functions .....		18
4-1-3. IC801 (M50964-220SP) Pin Functions .....		19
4-1-4. IC881 (HD404240A80S) Pin Functions .....		20
4-2. Circuit Boards Location .....		20
4-3. IC Block Diagrams.....		21
4-4. Semiconductor Lead Layouts.....		22
4-5. Block Diagram .....		23
4-6. Printed Wiring Boards		
– Audio Section – .....		27
4-7. Schematic Diagram		
– Audio Section – .....		31
4-8. Schematic Diagram		
– Syscon Section – .....		35
4-9. Printed Wiring Boards		
– Syscon Section – .....		39
5. EXPLODED VIEWS		
5-1. Overall Section .....		43
5-2. Front Panel Section .....		44
5-3. Chassis Section .....		45
5-4. Mechanism Section-1		
(TCM-200D4) .....		46
5-5. Mechanism Section-2		
(TCM-200D4) .....		47
6. ELECTRICAL PARTS LIST .....		48

## Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

## Flexible Circuit Board Repairing

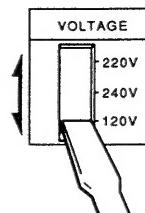
- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

TC-K333ESL : E Model

## Operating Voltage

Before connecting the unit to the power source, check that the operational voltage of your unit is the same as the local power supply.

Where purchased	Operating voltage
European countries	220 - 230 V AC, 50/60 Hz
Other countries	120, 220 or 240 V AC adjustable, 50/60 Hz A voltage selector is located on the rear panel. If the selector must be reset, disconnect the AC power cord and set the selector to the appropriate voltage.



VOLTAGE selector

## SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

**For higher quality recording/playback**

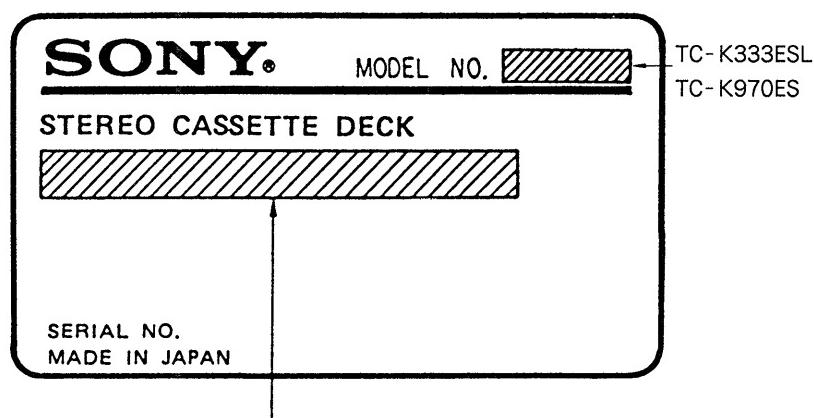
- **The Dolby HX PRO\* system** which improves the linearity of the tape's high-range response during recording.
- **Bias and recording level calibration** which ensures optimum recording conditions to bring out the best in every tape.
- **Three-head system (separate recording, playback and erase heads)** which allows you to instantly check the recorded sound while recording is in progress.
- **Professional-level deck design** for high mechanical stability and maximum performance.

**For your convenience**

- **The AMS and Memory Play functions** which provide easy access to a desired selection.
- **Timer-activated playback and recording** through the use of an optional timer.

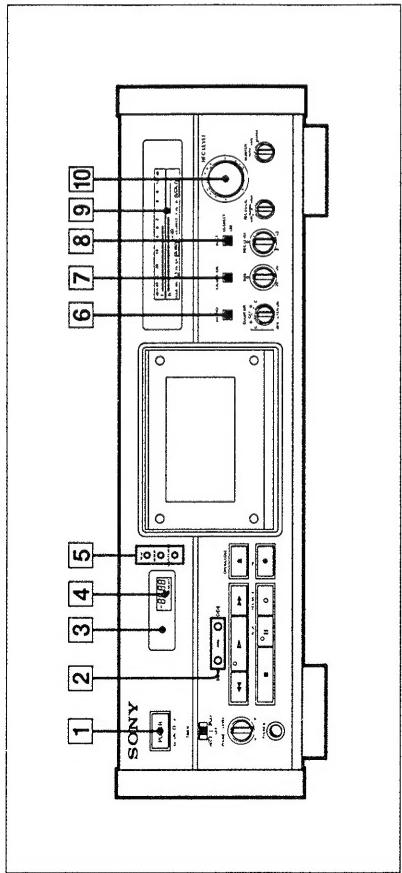
**For easier operation**

- **Easy-to-read digital linear counter** which shows the elapsed recording or playing time.

**MODEL IDENTIFICATION***— Specification Label —*

## SECTION 1 GENERAL

### Identification of Front Panel Parts



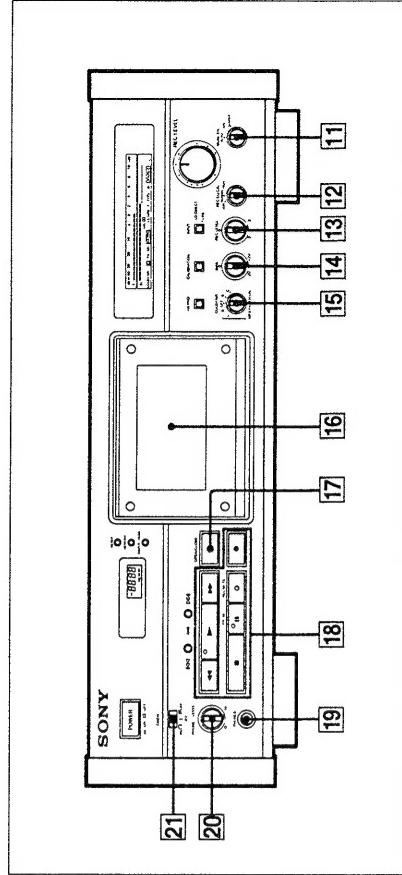
For details, refer to the page number indicated in ●.

- ① POWER switch
- ② AMS (Automatic Music Sensor) buttons ●
- ③ Remote sensor
 

You can remotely control this cassette deck with:

  - A remote commander that came with a Sony amplifier or receiver if it has the mark and cassette deck control capability.
  - An optional Sony remote commander with the mark and cassette deck control capability.
- ④ LINEAR COUNTER ●
- ⑤ Counter buttons
  - RESET button ⑩
  - MEMORY button ⑪ ⑫
  - DISPLAY MODE button ⑬
- ⑥ DOLBY HX PRO button ⑭ ⑮
- ⑦ CALIBRATION button ⑯
- ⑧ INPUT button ⑰
- ⑨ PEAK PROGRAM METER ⑱
- ⑩ REC (recording) LEVEL control ⑲ ⑳

(Continued on next page.)



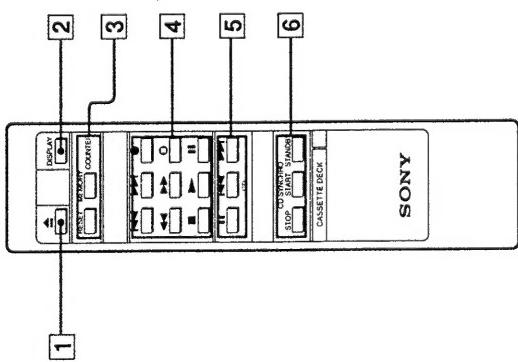
For details, refer to the page number indicated in ●.

- ⑪ MONITOR switch ⑯
- ⑫ REC/EQ CAL (recording equalizing calibration) switch (LOW, NORMAL, HIGH) ⑰
- ⑬ REC (recording) LEVEL control for calibration ⑯ ⑰
- ⑭ BIAS control ⑯ ⑰
- ⑮ DOLBY NR (noise reduction)/MPX FILTER switch ⑯ ⑰
- ⑯ Cassette holder
- ⑰ OPEN/CLOSE button
- ⑱ Tape operation buttons and indicators
  - ◀ (rewind) button
  - (stop) button
  - ▶ (fast forward) button
  - REC (recording) button and indicator
  - PAUSE button and indicator
  - REC MUTE (record muting) button ⑰
- ⑲ PHONES jack (stereo phone jack) ⑯
- ⑳ PHONE (headphones) LEVEL control
- ㉑ TIMER switch ⑯

This section is extracted from  
instruction manual.

## Remote Commander

(Except for European model)



The controls on the remote commander are identical in function and operation to those with the same name on the main unit.

For details, refer to the page number indicated in **●**.

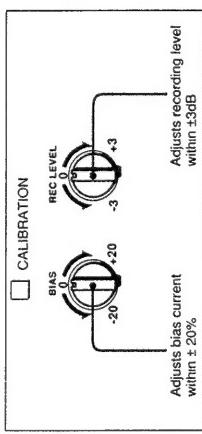
- 1**  $\blacktriangle$  (open/close) button
- 2** DISPLAY button
- 3** Counter buttons
- 4** Tape operation buttons
- 5** CD (Compact Disc) buttons  
for controlling Sony CD players
- 6**  $\blacktriangleright$  /  $\blacktriangleleft$  buttons for locating selections sequentially
- 7** CD SYNCHRO buttons  
for synchronized recording with a Sony CD player

## Making an Optimum Recording According to the Tape Type

(Except for European model)

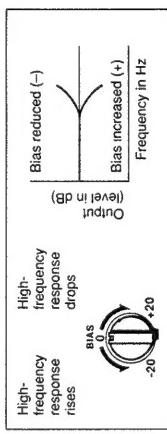
### Bias and Recording Level Calibration

There are many different types of cassettes on the market, each with varying magnetic properties. Although your unit is equipped with the AT'S (Automatic Tape Selection) system which sets the appropriate equalization characteristics and bias current for each tape type, an additional calibration adjustment can often produce even better results. Use the bias current and recording level calibration function to obtain the optimum recording conditions for your tape.



#### Bias calibration

Choosing the optimum bias current for a tape ensures minimum distortion and flat frequency response. Lowering the bias current boosts high-frequency response, but also results in higher distortion. Raising the bias, on the other hand, reduces distortion, but also dampens high-frequency response. Optimum bias is thus obtained when the bias current and high-frequency response are well balanced.



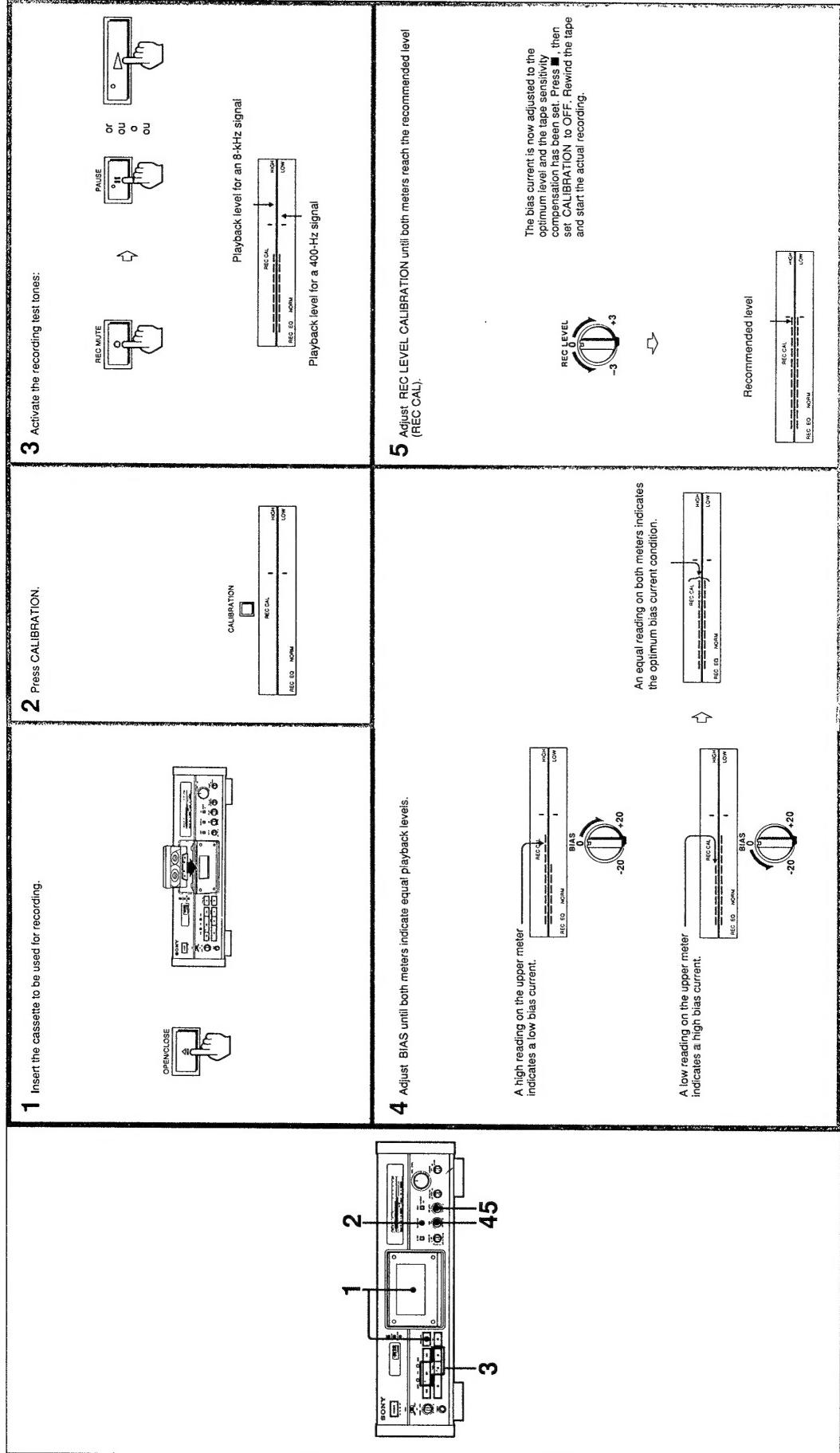
- \* If the bias current is higher or lower than the optimum setting for a certain tape, the frequency response changes as shown in the chart above. Changing the bias can thus be used to tailor the response to your liking, for example by slightly emphasizing the upper or lower end.

- \* The frequency response of metal tapes is much less affected by changes in the bias current than other tape types. With some tapes, the adjustment range of this deck ( $\pm 20\%$ ) may therefore not be sufficient to cover every possible requirement.

#### Recording level calibration

Even when the recording level is adjusted correctly, using a tape with low sensitivity will result in a low playback level. The REC LEVEL calibration control allows you to compensate for sensitivity differences among tapes to equalize both recording and playback levels. This is especially important when using the Dolby NR system, since it is most effective when recording and playback levels are the same.

## Making an Optimum Recording According to the Tape Type

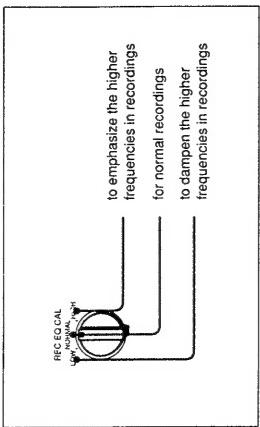


**Note** The sound cannot be monitored during the calibration operation. It takes 2 to 3 seconds to stabilize the test tone level.

## Making an Optimum Recording According to the Tape Type

### Recording Equalization Calibration

Although bias current and equalization are automatically set by the Automatic Tape Selection (ATS) function for the tape being used, you can use the REC EQ CAL switch to change the recording characteristics according to the nature of the source material or to compensate for the particular characteristics of the tape.



#### Bias Calibration Recording

To modify bands of sound as required, use the REC EQ CAL switch in conjunction with bias calibration, which enables you to record according to the tape's characteristics.

- When recording music which has strong middle and low frequencies  
Set the bias at flat with the REC EQ CAL switch set in the HIGH position to increase the bias current. Adjust BIAS so that the HIGH and LOW meters indicate equal readings.

- When recording music which has strong high frequencies  
Set the bias at flat with the REC EQ CAL switch set in the LOW position to decrease the bias current. Adjust BIAS so that the HIGH and LOW meters indicate equal readings.

**Note**  
With metal tape, because the amount of frequency characteristic modulation is not in proportion to that of the bias, the optimum bias current may not be obtained using the methods above.

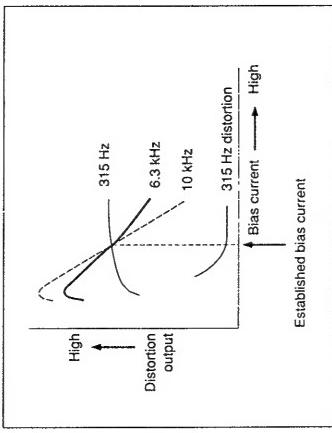
#### Another use of the REC EQ CAL switch

When using a special tape, the BIAS control with the REC EQ CAL switch set in the NORMAL position may not cause the HIGH and LOW meters to indicate equal readings. If this occurs, adjust the BIAS control after setting the REC EQ CAL switch to HIGH or LOW.

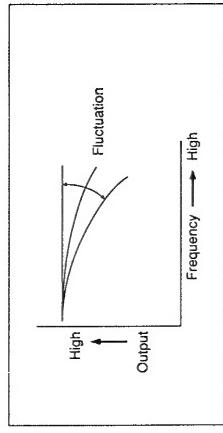
## Recording

### What is the Dolby HX PRO System?

The Dolby HX PRO system provides improved linearity in high-range frequency response during recording. Tapes recorded with this system retain the same high quality even when played back on other tape decks.



As shown above, characteristics such as output level and distortion differ widely according to the bias (high-frequency) current. In conventional systems, the bias current is susceptible to variations in certain recording signals (see diagram below) which may cause fluctuations in frequency response, distortion, or other unwanted characteristics.



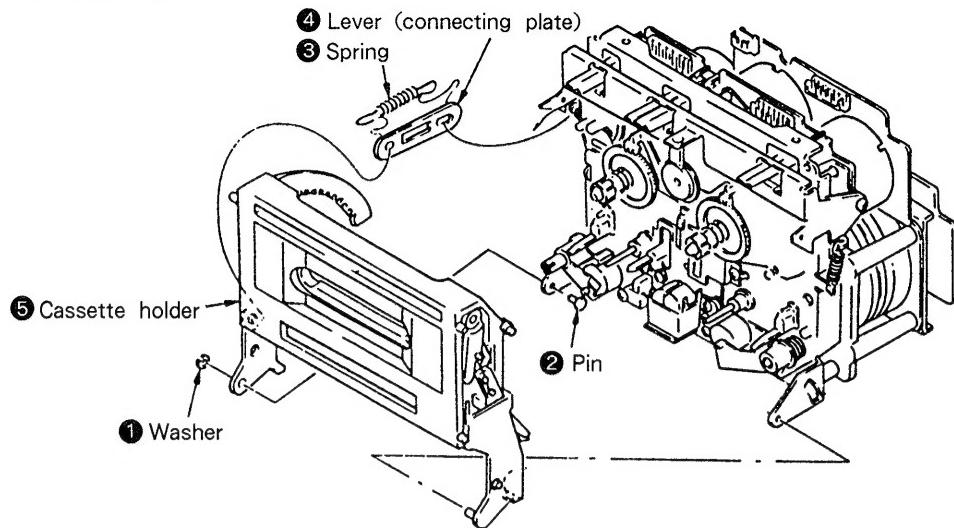
With the Dolby HX PRO system, the effective bias amount added to the bias current is controlled in millisecond units to greatly reduce distortion, improving linearity in high-range response and ensuring high-intensity recording with minimal distortion and noise.

## SECTION 2

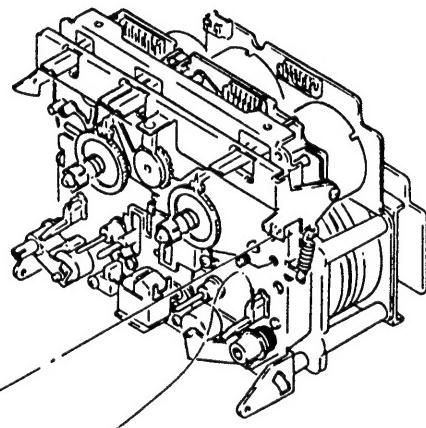
### DISASSEMBLY

- If the parts are marked with the numbers ①, etc., remove them in the order of the number.

#### Cassette Holder

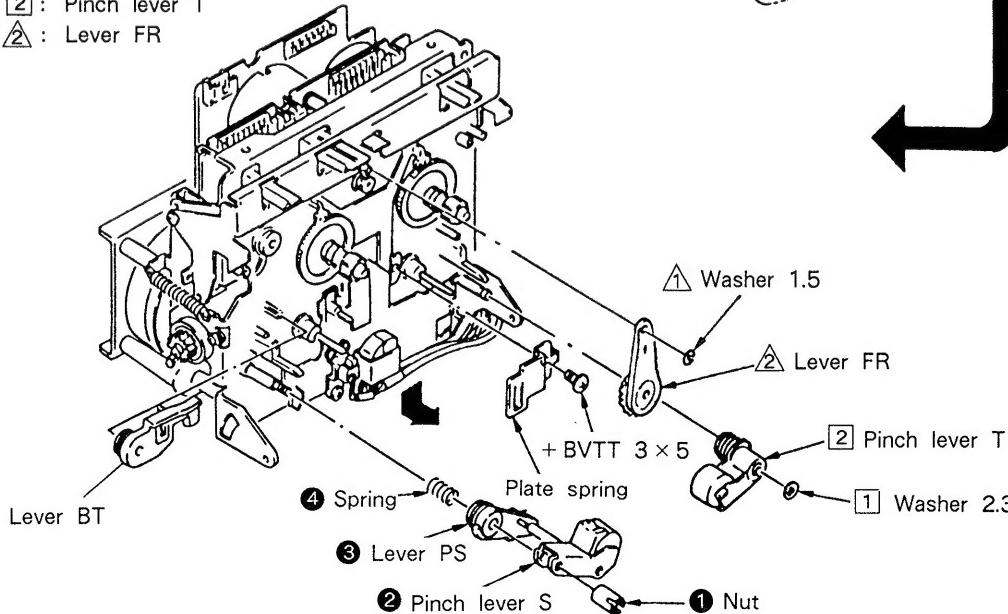


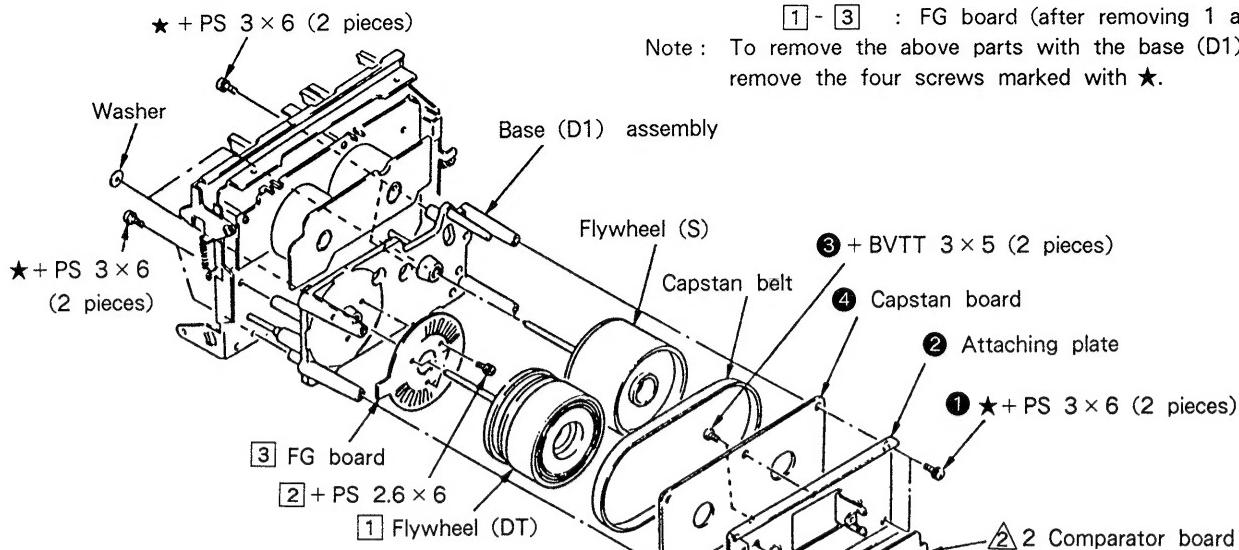
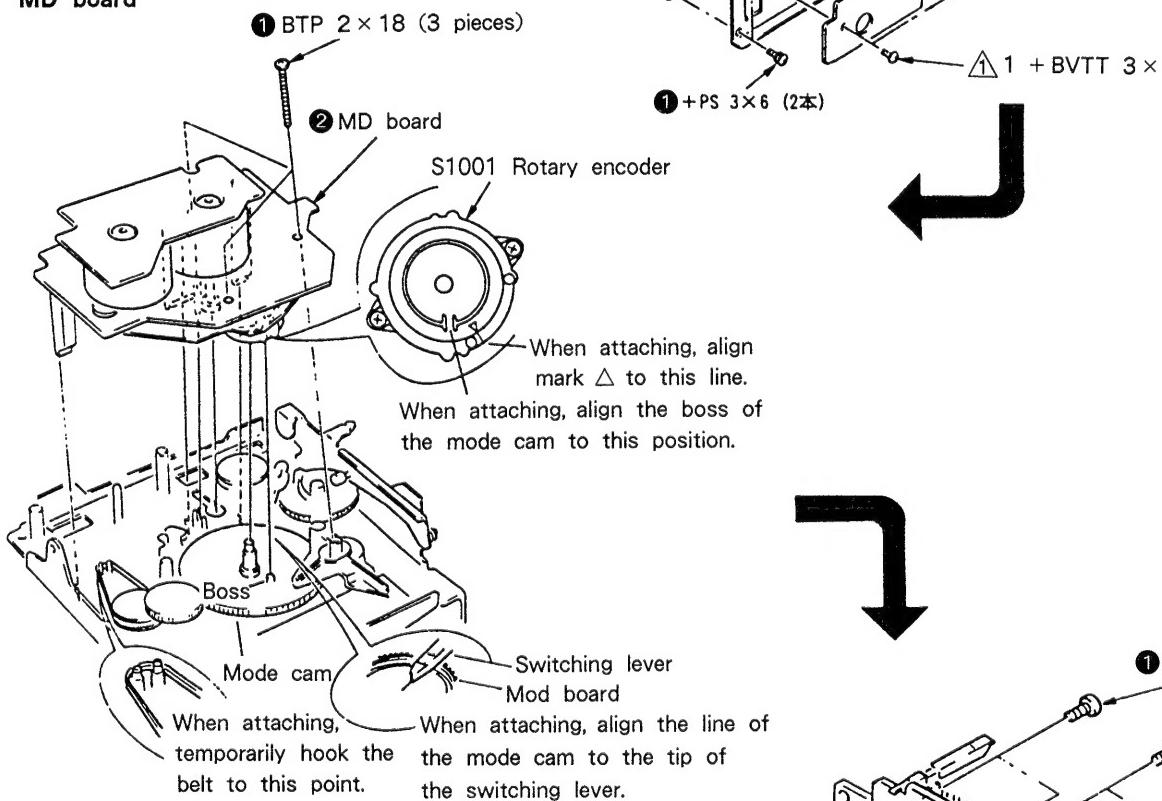
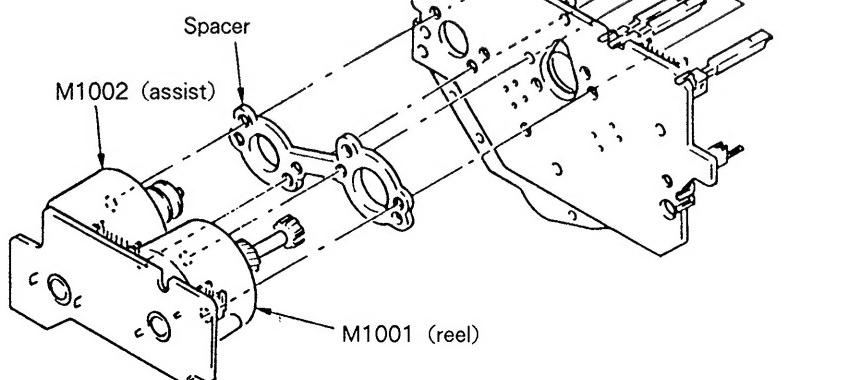
Ornamental Plate



#### Pinch Lever/Lever FR

① - ④ : Pinch lever S  
 ① and ② : Pinch lever T  
 ▲ and △ : Lever FR



**Comparator Board/Capstan Board/Flywheel/FG Board****MD board****Reel Motor Board**

## SECTION 3

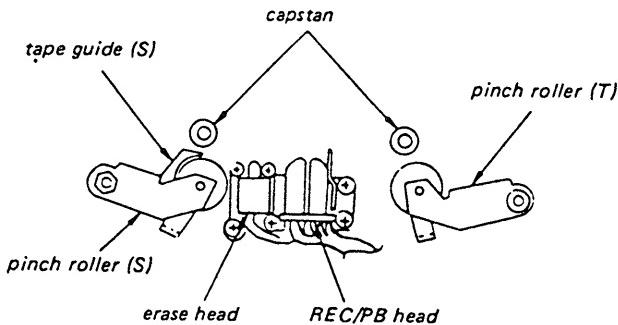
### ADJUSTMENTS

#### 3-1. MECHANICAL ADJUSTMENTS

##### PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:
 

record/playback head	pinch roller
erase head	rubber belts
capstan	idle
2. Demagnetize the record/playback and erase head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.



##### Tape Path Adjustment

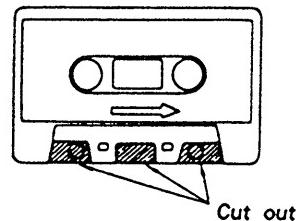
- Refer to Adjustment Position on page 12.

**Note :** When using the adjustment methods for other than replacement reasons, please do not tamper unnecessarily with the adjustment screws or the erasehead because either the supply pinch roller guide or the record/playback head will be made the standard tape paths. Moreover, when it is necessary to adjust and replace two or more of any of the heads and/or pinch rollers, replace them one by one, completely taking out the first tape path, and then replacing the second one.

##### Preparation :

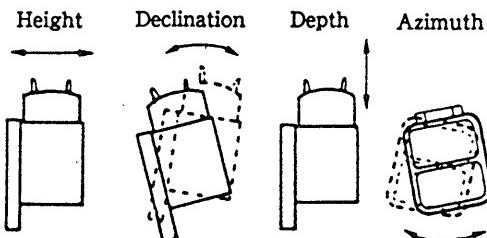
1. Mirror cassette CQ009C 8-909-708-01  
(or CQ012C 8-909-708-02)

If one does not have this, cut out the sections of a 120-minute cassette shell as indicated below and use that cassette.



2. Phillips screwdriver (medium-size) :  
For the head adjustment screws
- Blade-type screwdriver (large-size) :  
For the supply pinch roller adjustment screws
3. Pen light
4. WS-48B (3 kHz, 0 dB)
5. P-4-A100 (10 kHz, -10 dB)

**Definition of Terms :** The figures are of a record/playback head.



##### Adjustment Method :

###### Supply Pinch Roller

**Note :** Only perform this adjustment when the supply pinch roller is to be replaced.

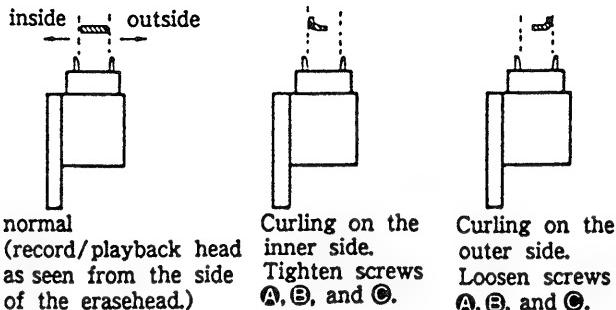
1. Insert the mirror cassette and put the unit in record/playback mode.
2. Check to see whether the tape is curling at the record/playback head guide or the pinch roller guide.  
If it is curling, remove the curl by adjusting the ④ tape curl adjustment screw. Then, check that the tape is running past the middle of the erasehead.

###### Record/playback Head

**Note :** Only perform this adjustment when the record/playback head is to be replaced.

1. Insert the mirror cassette and put the unit in record/playback mode.
2. (Height Adjustment) Check to see if the tape is curling at the tape guide of the head. If it is curling, tighten screws ①, ②, and ③, respectively by the same angle, moving the head so that it

remains at the same angle throughout the procedure. If it curls on the bottom side of the mirror cassette (actually the inner side), tighten all the screws equally; but loosen them if the tape begins to curl on the top side (outer side).

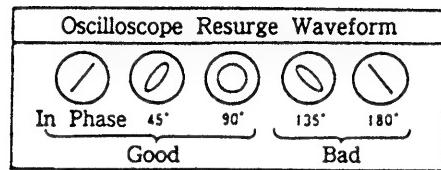
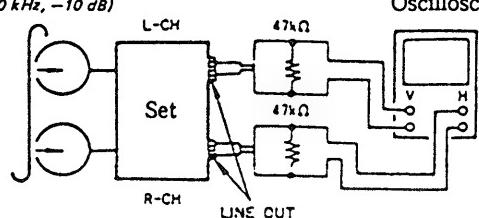


- (Declination Adjustment) While in the record/playback position, set the back tension to 0 (wind the supply reel with something thin like a pencil in a counterclockwise direction) and make sure there is no curling or shifting (shifting up/shifting down) at the guide of the record/playback head.

Because shifting can only occur due to a difference in the width of the tape and that of the tape guides (curling will otherwise occur), it is necessary to pay close attention since it can be easily overlooked. When there is a shift, tighten screws **B** and **C** equally and change the declination of the head. If the tape is shifting up, tighten the screws, and if it is shifting down, loosen them.

- Repeat the adjustments in steps 2 and 3 and fine adjust the height and the declination.
- (Preliminary Azimuth Adjustment) After demagnetizing and cleaning the adjustment head, play back WS-48B (3 kHz, 0 dB). Turn screw **C** so that the reading on the level meter of the unit or that of the level meter connected to LINE OUT is maximized. If the screw is turned at least half a revolution, repeat the adjustments from step 1.
- (Tape Path Check) Connect the oscilloscope to LINE OUT and play back P-4-A100 (10 kHz, -10 dB) to display a resurge waveform. After 20 seconds of record/playback (after the tension within the loop has been increased sufficiently), make sure the variation in the resurge is within  $\pm 90$  degrees (within  $\pm 45$  degrees is desired). If the variation is greater than this, it is because the declination and/or the height adjustment is not perfect. Repeat the adjustments from step 1.

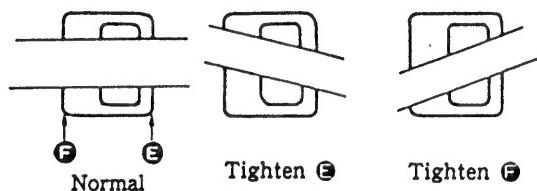
test tape  
P-4-100S  
(10 kHz, -10 dB)



#### Erasehead

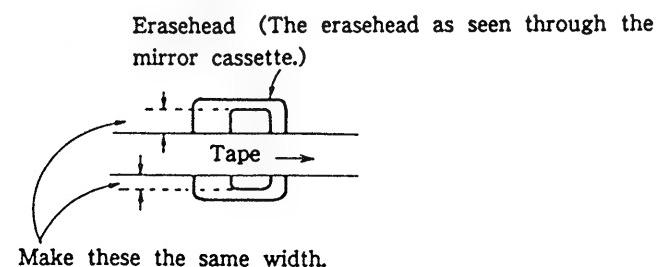
Note: Only perform this adjustment when the erasehead is to be replaced.

- Insert the mirror cassette and put the unit in record/playback mode.
- (Azimuth Adjustment) Adjust the azimuth of the erasehead by adjusting screws **B** and **C** so that the tape runs as evenly as possible.

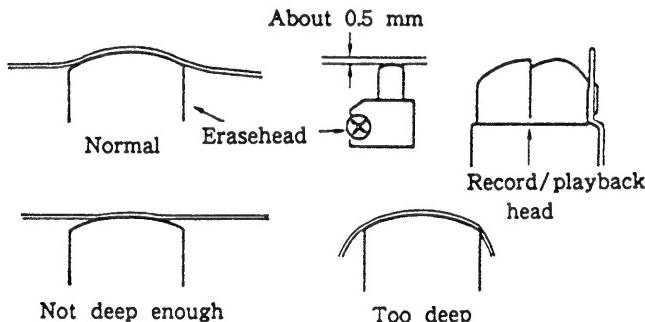


(The erasehead as seen when erasing the mirror cassette.)

- (Height adjustment) Turn screws **D**, **E**, and **F** all by the same angle so that the portions of the erasehead visible at top and bottom are nearly of equal width. If the width at the top is greater, tighten the screws; if the width at the bottom is greater, loosen the screws.



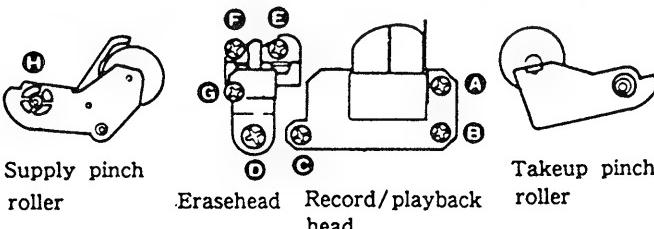
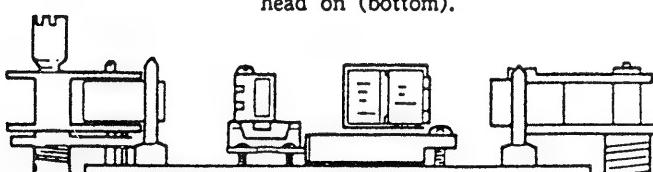
4. (Declination Adjustment) Leaving it in the playback position, put the back tension to 0 and make certain the erasehead part and supply pinch roller guide part do not shift. If there is a shift, turn the screw ⑩ and change the declination. Looking at it using the mirror cassette, if the tape shifts up, tighten the screw, and if it shifts down, loosen the screw.
5. Repeat the adjustments beginning with step 2 and fine adjust the height and declination. And make sure the tape does not curl up on the pinch roller guide or the guide part of the record/playback head.
6. (Depth Adjustment) In order to make the entire head play the tape smoothly, and to make sure the depth of the erasehead is neither too shallow nor too deep, loosen screw ⑨ a bit.



#### Check

1. Check to make sure that there are no curls or shifts throughout the whole tape path and that the tape runs smoothly.
2. Reapply the locking compound to the adjusted screws. (The locking compound should only be applied to screw ⑨ after the azimuth has been adjusted.)

**Adjustment Position:** As seen from the cassette, side (top) and MD as seen head on (bottom).



#### Pinch Roller Pressing Force Measurement

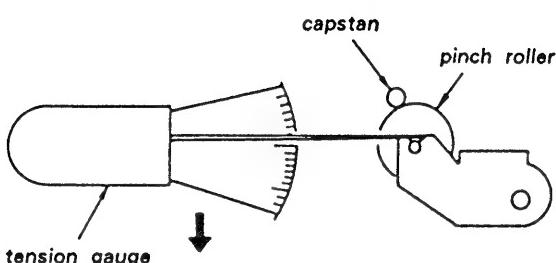
Mode : playback

Hook needle of the tension gauge to the pinch roller shaft and push back pinch roller to detach it from capstan. Then, return it gradually to capstan and read the gauge when the pinch roller begins turning.

#### Standard Limits :

Tape-up side : 270 - 350g (9.5 - 12oz)

Supply side : 180 - 280g (6.4 - 9.9oz)



#### 3-2. ELECTRICAL ADJUSTMENTS

**Note:** The adjustment should be performed in the order given in this service manual.  
The adjustments should be performed for both L-CH and R-CH.

- Simultaneous REC/PB Mode:

Input the signals to LINE IN terminal and set to REC mode. Set the monitor switch to TAPE, and monitor the recorded signal from LINE OUT terminal.

- Switch Position:

DOLBY NR.....	OFF
TIMER.....	OFF
MONITOR.....	TAPE
HX PRO .....	OFF
CALIBRATION.....	OFF
CD DIRECT.....	OFF
BIAS .....	CENTER CLICK
REC LEVEL .....	CENTER CLICK

- Standard Record:

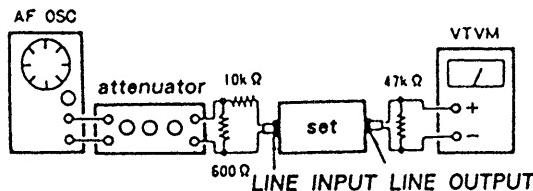
Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.

#### Standard Input Level

Input Terminal	LINE IN
source impedance	10 kΩ
input level	0.25 V (-10 dB)

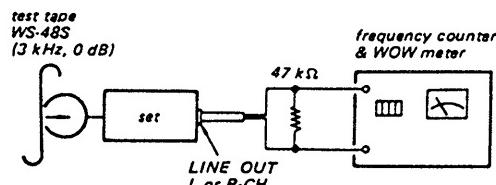
**Standard Output Level**

Output Terminal	LINE OUT
load impedance	47 kΩ
output level	0.44 V (-5 dB)

**Torque Adjustment and Measurement**

1. Insert a tape for torque measurement, CQ-102C, and put the set to PLAY mode. Adjust RV801 so that the reading of the torque meter is  $40 \pm 5\text{g.cm}$ .
2. After the adjustment, measure the back-tension and the FF/REW torque and check that the following specifications are satisfied.

Torque	Torque Meter	Reading
FWD	CQ-102C	35 - 45 g·cm (0.49 - 0.64 oz·inch)
FWD Back tension	CQ-102C	7 - 12 g·cm (oz·inch)
FF/REW	CQ-201B	55 - 120 g·cm (0.97 - 1.67 oz·inch)

**Tape Speed/WOW Check****Procedure:**

1. Measure the output frequency and the WOW value while playing back the tape top of the test tape.
2. Turn over the test tape, measure the output frequency and the WOW value, and check the difference from the values of the step 1.

**Adjustment Limits :**

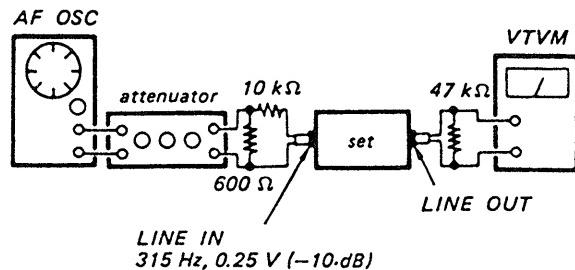
TAPE SPEED deviation:	within 2,990 to 3,010 Hz
TAPE SPEED fluctuating width:	within 2,990 to 3,010 Hz
WOW (WRMS):	0.037% or less

**MPX FILTER Check**

Setting : DOLBY switch : OFF  
MPX FILTER switch : OFF

**Procedure :**

1. Mode: stop



LINE IN  
315 Hz, 0.25 V (-10 dB)

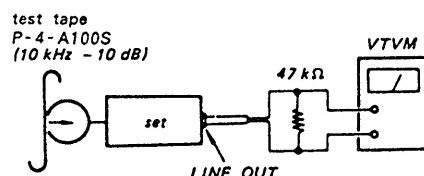
2. Apply 315Hz, 0.25V (-10dB) signal and adjust REC LEVEL (RV501) control so that the LINE OUT level is 0.44V (-5dB).
3. Apply 19kHz 0.25V (-10dB) signal and confirm that the LINE OUT level is 0.013V (-35dB) or less.

**Adjustment Limits :**

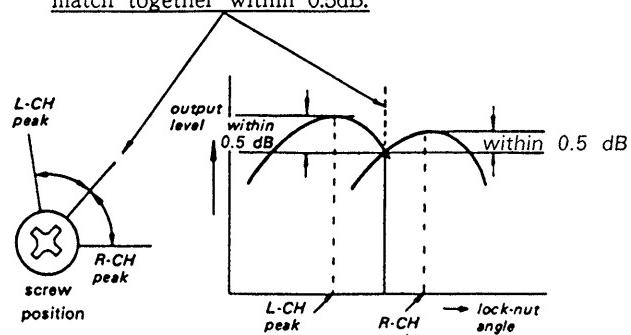
DOLBY NR switch : B or C  
MPX FILTER switch : Line output level when ON.  
315Hz : Within 0.49 to 0.39V (within -4dB to -6dB)  
19kHz : 0.013V (-35dB) or less

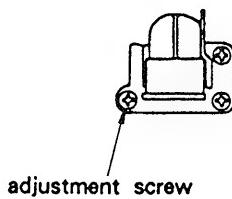
**Record/Playback Head Azimuth Adjustment****Procedure :**

1. Mode : playback

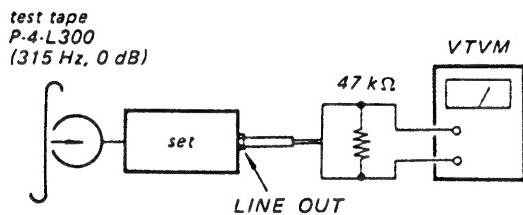


2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.



**Adjustment Location :****Playback Level Adjustment****Procedure:**

Mode: playback



Adjust RV101 (L-CH) and RV201 (R-CH) to obtain the specified LINE OUT level.

**Adjustment Limits :**

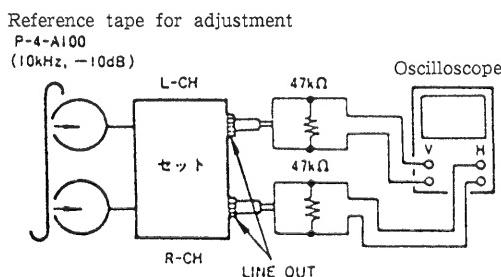
LINE OUT level : 0.42 to 0.46 V  
(-5.3 to -4.7 dB)

Level difference between channels:  
less than 0.5 dB

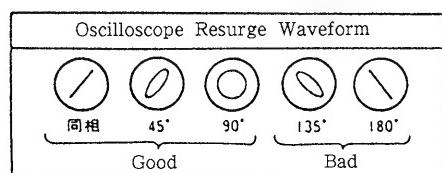
Check that the LINE OUT level does not change in playback mode while changing the mode from playback to stop several times.

**3. Phase check**

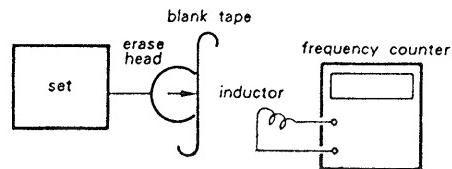
— Play mode —



4. Check that the phase difference between L-ch and R-ch is within 0 ~ (same to 90°).

**Bias OSC Frequency Adjustment****Procedure :**

1. Record mode



1. Connect the frequency counter to the inductor which functions at 10 mH. (When the inductor is a closed magnetic circuit, redesign the inductor to be an open magnetic circuit.)
2. Remove the cassette lid, insert the cassette, and put the unit into REC mode.
3. Move the inductor from the side in close to the erase head to check the value of the bias.
4. Adjust CP501 so that the reading on the frequency counter is  $105\text{kHz} \pm 1\text{kHz}$ .

**Bias current adjustment**

1. Set the HX PRO switch to ON and insert the METAL tape.
2. Set RV104, RV204, RV105, RV205, RV106, and RV206 to be in the center position.
3. Connect a digital voltmeter to CNE504 (between 2-1 and 2-3) and adjust the adjustment cores of T101 and T201 so that the voltage is minimized.

 **$\text{CrO}_2$  Bias and Record Level Adjustment**

**Note :** This adjustment should be made before Record Bias Adjustment.

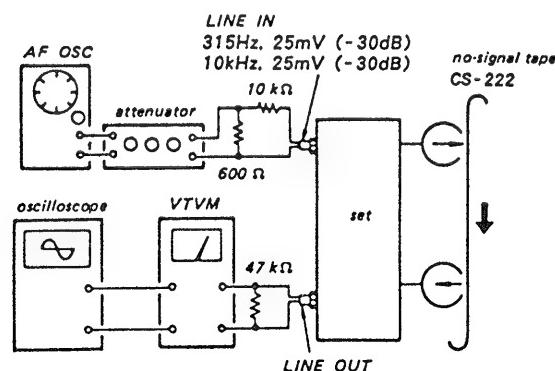
**Setting:**

**REC LEVEL** knob: standard record position  
(See page 12.)

**HX PRO** switch : ON

**Procedure:**

1. Mode: simultaneous REC/PB



2. Adjust RV106 (L-CH) and RV206 (R-CH) so that the playback output level of 10kHz signal is 0.3dB – 0.3dB with respect to that of 315Hz. • • • Record Bias Adjustment.
3. Adjust RV102 (L-CH) and RV202 (R-CH) so that the playback output level of 315Hz is -25.3dB to -24.7dB. • • • Record Level Adjustment.

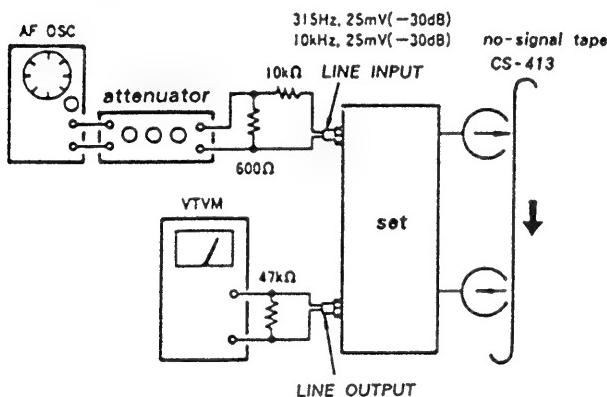
#### Metal Bias Adjustment

##### Setting :

REC LEVEL Knob : standard record position  
(See page 12.)

##### Procedure :

1. Mode : simultaneous REC/PB



2. Adjust RV510 (L-CH) and RV205 (R-CH) so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.5 dB to – 0.5dB.

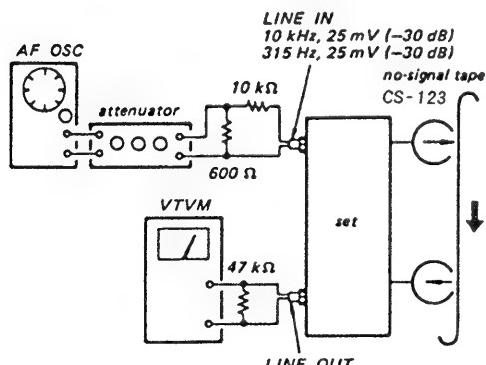
#### Normal Bias Adjustment

##### Setting:

REC LEVEL knob: standard record position  
(See page 12.)

##### Procedure:

1. Mode: simultaneous REC/PB



2. Set the HXPRO switch to ON.
3. Adjust RV103 (L-CH) and RV203 (R-CH) so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.5dB to – 0.5dB.
4. Set the HXPRO switch to OFF.
5. Adjust RV104 (L-CH) and RV204 (R-CH) so that the difference between the playback output at 10kHz when the HXPRO is ON and that of 10kHz when ON is within 0.5dB to – 0.5dB.

#### Meter Level Adjustment

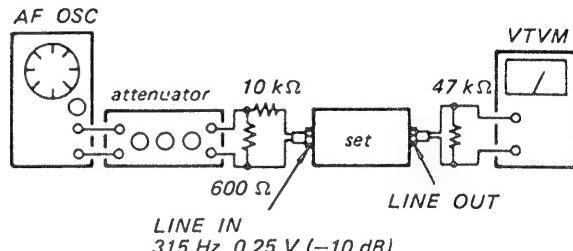
##### Setting :

REC LEVEL Knob : standard record position  
(See page 12.)

MONITOR : SOURCE

##### Procedure :

1. Stop mode



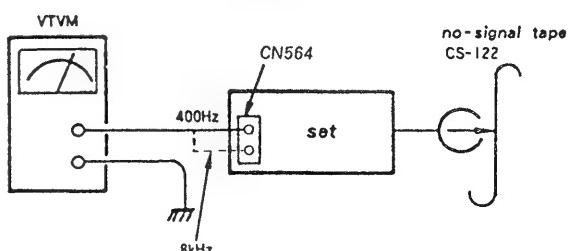
2. Adjust RV107 (L-CH) and RV207 (R-CH) so that a reading of the meter is set to OVU and the lamp is lit.
3. Adjust REC level so that the LINE OUT level is set to +10dB and check that all the lamps are lit.

#### Calibration OSC and Calibration Meter Adjustment

Setting : CALBRATION switch : ON

##### Procedure (OSC OUT LEVEL) :

1. Mode : record (no-signal (LINE INPUT))

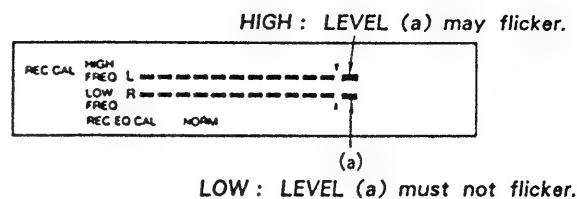
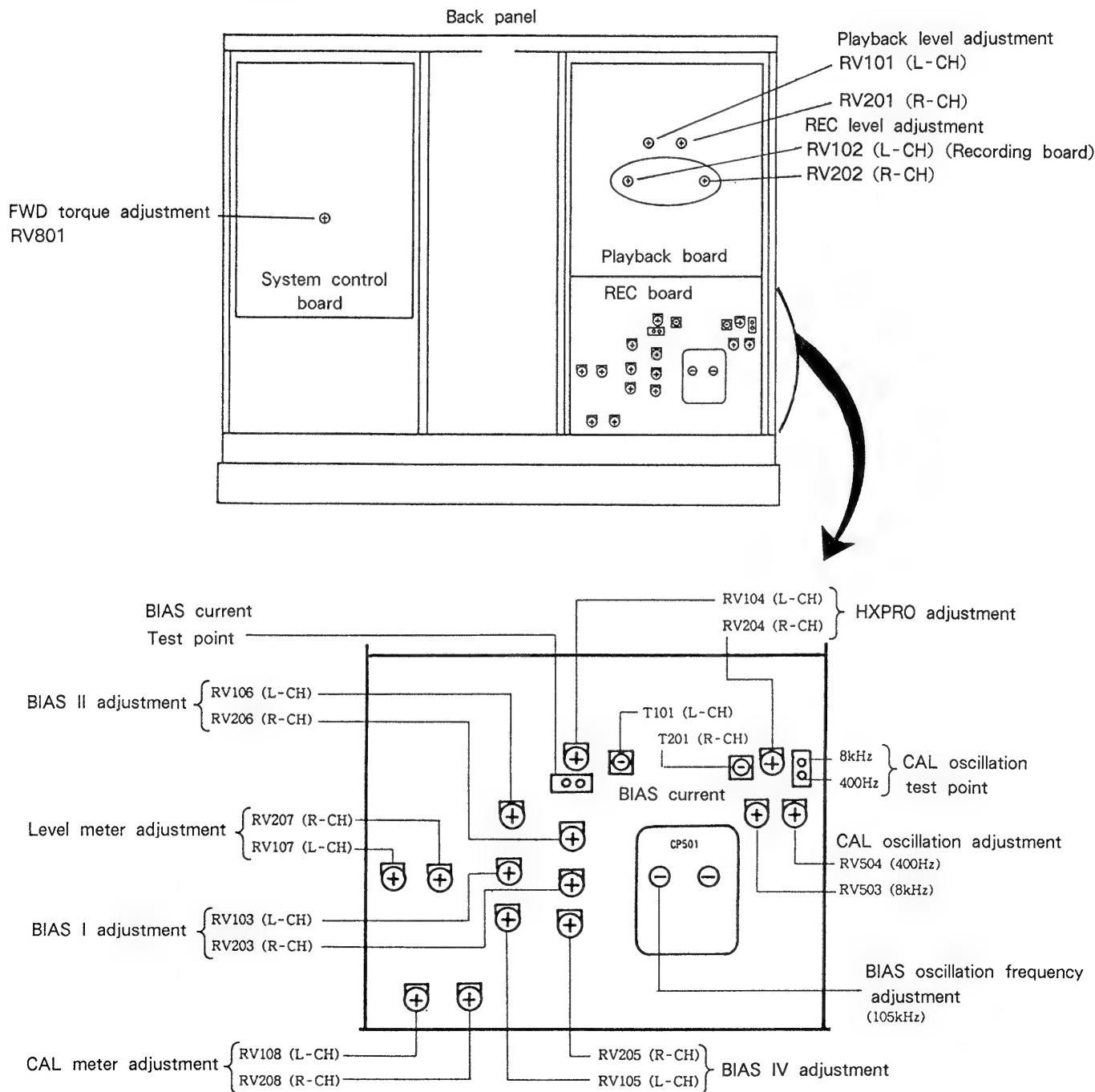


2. Adjust RV504 so that a check-point level at 400Hz is +10dB.
3. Adjust RV503 so that a check-point level at 8kHz is +10dB.

**Procedure (CAL METER ADJ) :**

1. Put the set in record mode and adjust RV208 (HIGH) so that HIGH FREQ segments in the CAL LEVEL meter light thoroughly up to 0 VU as shown in the figure below. Segment (a) may flicker.

2. Preset RV108 (LOW) so that segment (a) in LOW FREQ CAL LEVEL meter lights. Then adjust RV204 to the point where segment (a) goes out.

**Location Diagram of the Adjustment Parts**

## SECTION 4

### DIAGRAMS

#### 4-1-1. IC502, 505 (CX20188) PIN FUNCTIONS

An electronic switch circuit for the operation mode control is included. Controls are performed by adding direct current voltages VH, VM, and VL to Dolby OFF/B/C and calibration/REC/Playback terminals.

CX20188	Pin name	Description
Pin No.		
1.	Vcc	Positive power supply terminal.
2, 41.	REC IN	Recording input terminal.
3.	I REF	Reference current input terminal.
4, 39.	PB IN	Playback input terminal.
5.	CAL/REC/PB	Calibration/recording/playback select terminal
6, 37.	PB FB	Playback feedback terminal.
7, 36.	REC FB	Recording feedback terminal.
8, 35.	GND	GND terminal.
9, 34.	LINE OUT	Line output (decode output) terminal.
10, 33.	SSK	Spectral skewing switch terminal.
11, 32.	VF IN	Encode circuit input terminal.
12, 31.	HPF H	HLS high-pass filter terminal.
13, 30.	TCH 2	HLS detector time constant terminal 2.
14, 29.	TCH 1	HLS detector time constant terminal 1.
15, 28.	WT H	HLS encoder error reduction terminal.
16, 27.	TCL 2	LLS detector time constant terminal 2.
17, 26.	TCL 1	LLS detector time constant terminal 1.
18, 25.	WT L	LLS encoder error reduction terminal.
19, 24.	HPF L	LLS high-pass filter terminal.
20, 23.	ANT S	Anti-saturation terminal.
21, 22.	REC OUT	Recording output (encode output) terminal.
38.	OFF/B/C	Dolby NR off/B type/C type select terminal.
40.	CAL IN	Calibration input terminal.
42.	Vee	Negative power supply terminal.

MODE	VOLT
VH	3 to 9.9V
VH	-0.7 to 0.7V
VL	-9.9 to -3

## 4-1-2. IC601 (M50940-313SP) PIN FUNCTIONS

Level meter display of 24-segment fluorescent display, etc., are performed by receiving direction from the master microcomputer (IC801).

Pin No.	Pin name	I/O	Description
1.	Vref	I	A/D input-port reference voltage input(+5V)
2.	$\phi L$	I	Not used. (Connected to +5V)
3.	$\phi R$	I	Not used. (Connected to +5V)
4.	DATA	I	Data input from the master microcomputer(IC801)(analog)
5. ~6.	ADE1~ADRO	I	Data input from the master microcomputer(IC801)(analog)
7.	KEY	I	Not used. (Connected to +5V)
8.	LEVEL L	I	Level meter L-CH input(analog) from the meter amplifier(IC514)
9.	LEVEL R	I	Level meter R-CH input(analog) from the meter amplifier(IC514)
10. ~13.	<u>GRID6~GRID3</u>	0	Not used.
14. ~15.	<u>GRID2~GRID1</u>	0	Fluorescent display grid output
16.	<u>C00</u>	0	Not used.
17.	<u>PLAY</u>	0	Not used. (Connected to pin ⑩.)
18.	<u>PLAY</u>	0	Not used.
19.	<u>PAUSE</u>	0	Not used.
20.	<u>REC</u>	0	Not used.
21.	<u>TAPE</u>	0	Fluorescent display segment output("TAPE" displayed). "L": TAPE displayed. "H": SOURCE displayed.
22.	OVER LEVEL	0	Fluorescent display segment output("OVER LEVEL" displayed). It is displayed when "L".
23.	TYPE I	0	Fluorescent display segment output("TYPE I" displayed). It is displayed when "L".
24.	TYPE II	0	Fluorescent display segment output("TYPE II" displayed). It is displayed when "L".
25.	TYPE IV	0	Fluorescent display segment output("TYPE III" displayed). It is displayed when "L".
26.	CNVss	-	Power supply terminal(GND)
27.	<u>RESET</u>	I	Reset input
28.	XIN	I	Clock input(4MHz)
29.	XOUT	0	Clock output.
30.	XCIN	-	Not used. (Connected to GND)
31.	XCOUT	-	Not used.
32.	Vss	-	Power supply terminal(GND)
33.	$\Phi$	0	Not used.
34.	VER	I	Version switching input(Always set to "L")
35.	<u>TEST</u>	I	Test mode input. "L": All the lamps of the meter are lit.
36.	CAL	I	Calibration switch(S602) input. "L": CAL mode. "H": Normal mode.
37.	IN	I	Not used. (Connected to GND.)
38.	VP	I	Fluorescent display segment output's pull-down power supply terminal(-22V)
39. ~62.	S23~S0	0	Fluorescent display segment output(meter display)
63.	AVcc	-	Power supply terminal(+5V)
64.	Vcc	-	Power supply terminal(+5V)

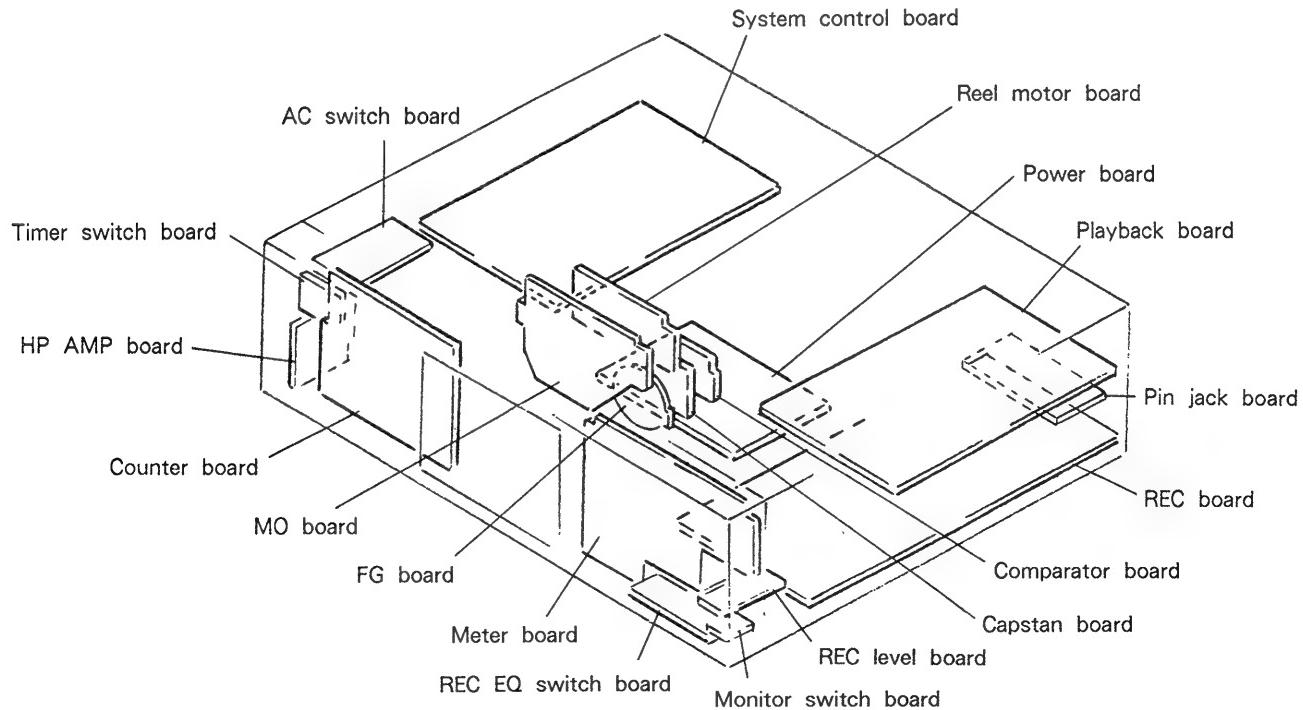
## 4-1-3. IC801 (M50964-220SP) PIN FUNCTIONS

Pin No.	Pin name	I/O	Description
1.	VCC		Power supply: +5V.
2.	AVss		Analog GND.
3.	Vref	I	A/D port reference voltage input.
4.	DA		Not used for this model.
5.	PWM		Not used for this model.
6.	P_OFF		Not used for this model. Connected to GND.
7.	LED	O	PAUSE LED output.
8.	LED	O	REC LED output.
9.	LED	O	PLAY LED output.
10.	AD1	I	Key input. 0V=▲, 1V=■, 2V=◀, 3V=▶, 4V=●.
11.	AD2	I	Key input. 0V=▶, 1V=■, 2V=◀, 3V=▶, 4V=○.
12.	AMS SIG	I	AMS signal input. No song detected = Low. Song detected = High.
13.	AD4	I	Key input. 2V = DISPLAY. 3V = MONITOR.
14.	CODE	I	Remote control category select switch.
15.	ALB		Connected to 5V.
16.	φR	I	Take-up reel base sensor input.
17.	φL	I	Supply reel base sensor input.
18.	C RESET		Model select input. Connected to GND.
19.	C MEMORY		Model select input. Connected to GND.
20.	COO		Not used for this model.
21.	POWER IN	I	Power on and off detection.
22.	SIRW	I	SIRCS phase input.
23.	SIRE	I	SIRCS reverse phase input.
24.	T-REC	I	Timer REC switch input.
25.	T-PLAY	I	Timer PLAY switch input.
26.	INT	I	External interruption input. Interruption process is performed when the power is on or off.
27.	Vss		GND.
28.	RESET	I	Reset input.
29.	XIN	I	Clock input (4 MHz).
30.	XOUT	O	Clock output (4 MHz).
31.	φ out		Not used for this model.
32.	Vss		GND.
33.	C1	I	Rotary encoder input to detect the position of the head base of the mechanical block.
34.	C2	I	Rotary encoder input to detect the position of the head base of the mechanical block.
35.	C3	I	Rotary encoder input to detect the position of the head base of the mechanical block.
36.	C4	I	Rotary encoder input to detect the position of the head base of the mechanical block.
37.	OPEN SW	I	OPEN switch input of the mechanical block.
38.	CLOSE SW	I	CLOSE switch input of the mechanical block.
39.	DOOR SW	I	DOOR switch input of the mechanical block.
40.	REC SW	I	REC switch input of the mechanical block.
41.	M PLAY	O	Reel motor rotates at PLAY speed.
42.	M FAST	O	Reel motor rotates at FF/REW speed.
43.	M FWD	O	Reel motor rotates.
44.	M REV	O	Reel motor rotates in reverse.
45.	CAM DOWN	O	Head base DOWN output of the mechanical block
46.	CAM UP	O	Head base UP output of the mechanical block
47.	C OFF	O	Counter light-off output
48.	M OFF	O	Meter light-off output
49.	BIAS	O	Bias oscillation on and off control
50.	R Mt	O	REC MUTE.
51.	M Mt		Not used for this model.
52.	T Mt	O	Tape MUTE. Goes to low when the tape is being played.
53.	S Mt	O	Source MUTE. Goes to low three seconds after the power is on.
54.	AMS	O	AMS switch output. Goes to low when AMS is being used.
55.	MONITOR		Not used for this model. Connected to GND.
56.	HALF		Not used for this model. Connected to GND.
57.	DAT3	O	Outputs parallel data for the counter display.
58.	DAT2	O	Outputs parallel data for the counter display.
59.	DAT1	O	Outputs parallel data for the counter display.
60.	DATO	O	Outputs parallel data for the counter display.
61.	DATD	O	Outputs parallel data for the counter display.
62.	CLK	O	Clock output to transmit the parallel data.
63.	LATCH	O	Output for latching the transmitted data.
64.	CAL IN	I	CAL switch input.

**4-1-4. IC881 (HD404240A80S) PIN FUNCTIONS**

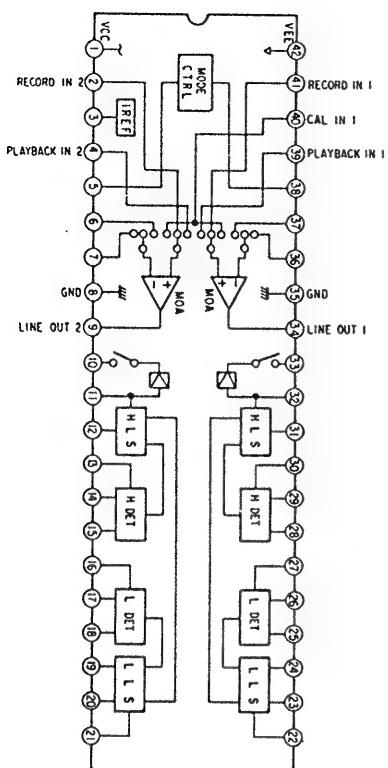
Fluorescent dynamic display is performed by receiving count data from the master microcomputer (IC801)

Pin No.	Pin name	I/O	Description
1.	SG3	O	Fluorescent display grid output
2.	G4	O	Fluorescent display grid output
3.	dot	O	Fluorescent display segment output
4.	P DWN	I	Pull-down power supply terminal for fluorescent display segment output (-22V)
5.~11.	g~a	O	Fluorescent display segment output
12.	-	-	Not used.
13.~16.	DIM1~DIM4	I	Dimmer input (Pins ⑭ and ⑯ are "H". Others are opened and fixed: Blanking time 550usec; grid ON time 450usec.)
17.~20.	-	-	Not used.
21.	Vcc	-	Power supply terminal (+5V)
22.	SCK	I	Shift clock input (250kHz) from the master microcomputer (IC801)
23.	SI	I	Serial data input (Data are sent by 1 byte every 6msec.) from the master microcomputer (IC801)
24.~25.	-	-	Not used.
26.	RESET	I	Reset input from the master microcomputer (IC801). Reset when "H".
27.	TEST	I	Connected to +5V.
28.	OSC1	I	Clock input (4MHz)
29.	OSC2	I	Clock input (4MHz)
30.	GND	-	Power supply terminal (GND)
31.~34.	-	-	Not used.
35.	MLED	O	Not used. (Connected to +5V)
36.~40.	-	-	Not used.
41.	G2	O	Fluorescent display grid output
42.	G1	O	Fluorescent display grid output

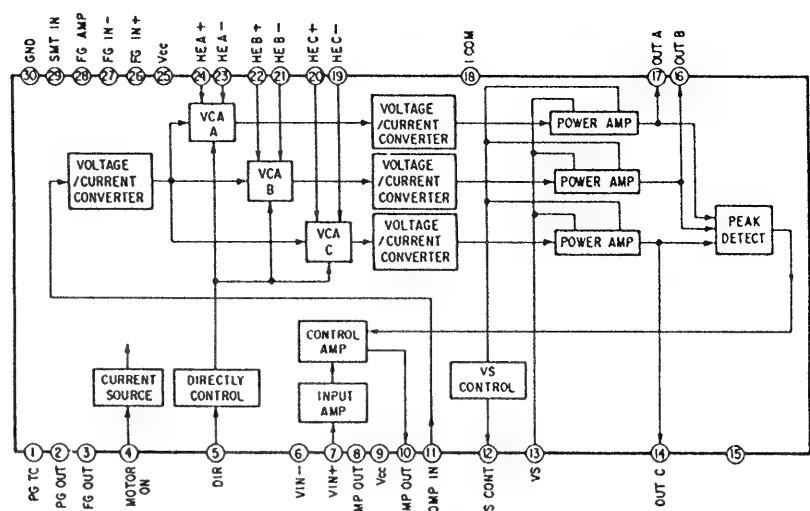
**4-2. CIRCUIT BOARDS LOCATION**

## 4-3. IC BLOCK DIAGRAMS

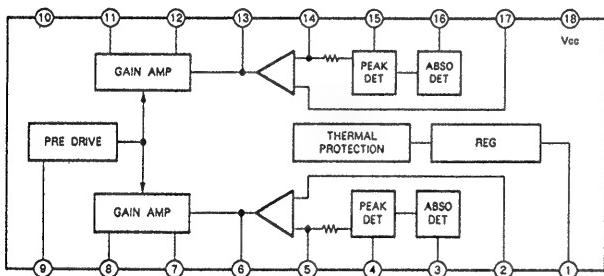
IC502, 505 CX20188



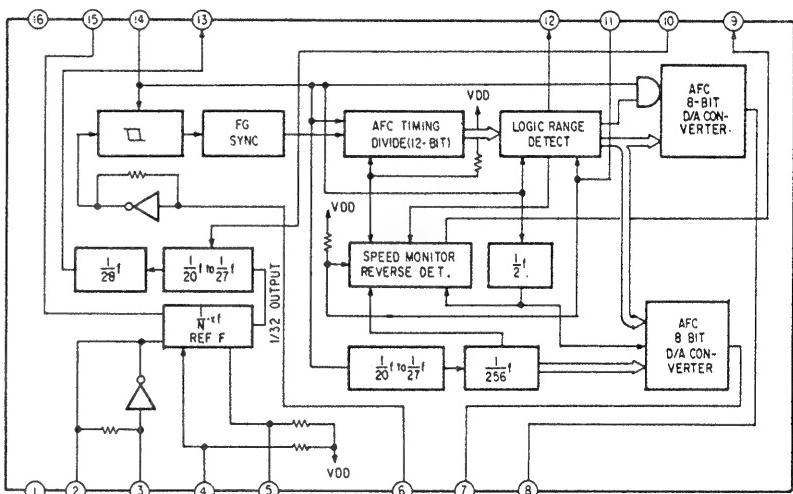
IC902 CX20174



IC508 μPC1297CA

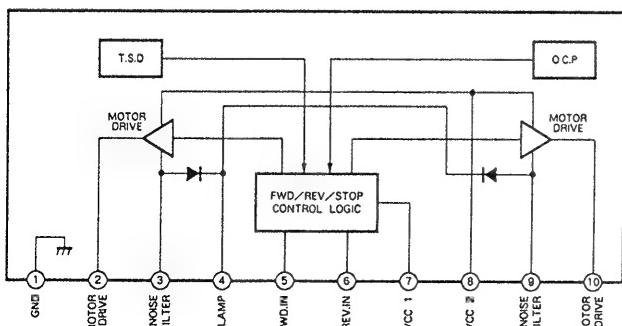


IC952 TC-9142P



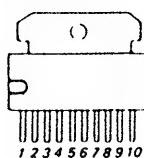
IC802 BA6219B

IC803 LB1641

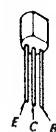


## 4-4. SEMICONDUCTOR LEAD LAYOUTS

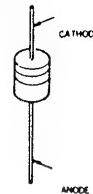
BA6219B



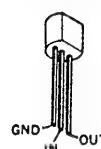
2SB716  
2SC945-P  
2SC1815-GR  
2SD666A



RD5.1JS-B1  
HZA6C1L  
HZA6C3L  
UZL-6M2  
UZL-24L  
1SS202-1



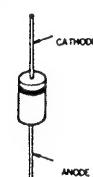
M5F7807  
RC79L12A



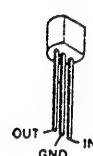
DTA114ES  
DTA144ES  
DTC114ES  
DTC124ES  
DTC143ES  
DTC144ES  
2SB1370-EF  
2SC2603-EF  
2SC2682-QPE  
2SC3623A-LK  
2SD2061-EF



HZ6B2L  
HZ12B2L  
10E2N



M5F7907  
RC78L12A



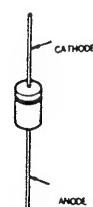
2SK246-GR2



2SA985A  
2SC2275A



30DF2



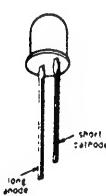
2SK147



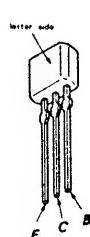
2SB734-34



SEL4414E-C  
SEL4814A-CD



2SA1175-HFE  
2SD1020-HFE

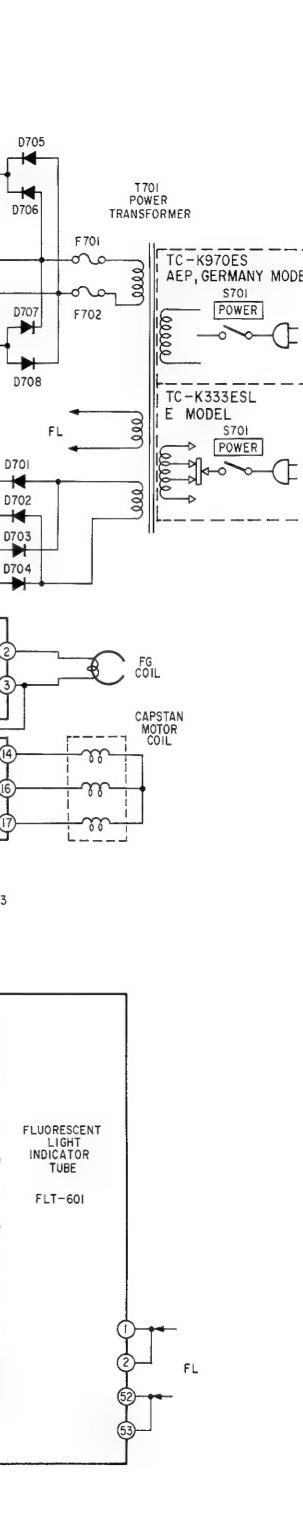
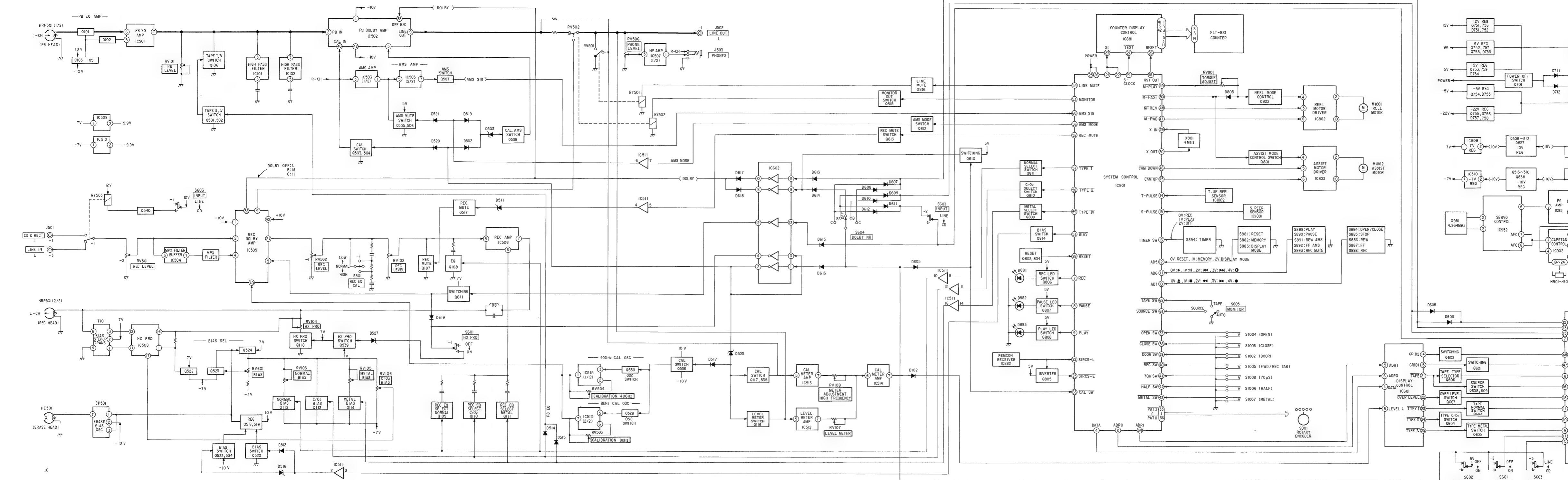


SEL4214S



1. Anode  
2. Cathode

#### 4-5. BLOCK DIAGRAM



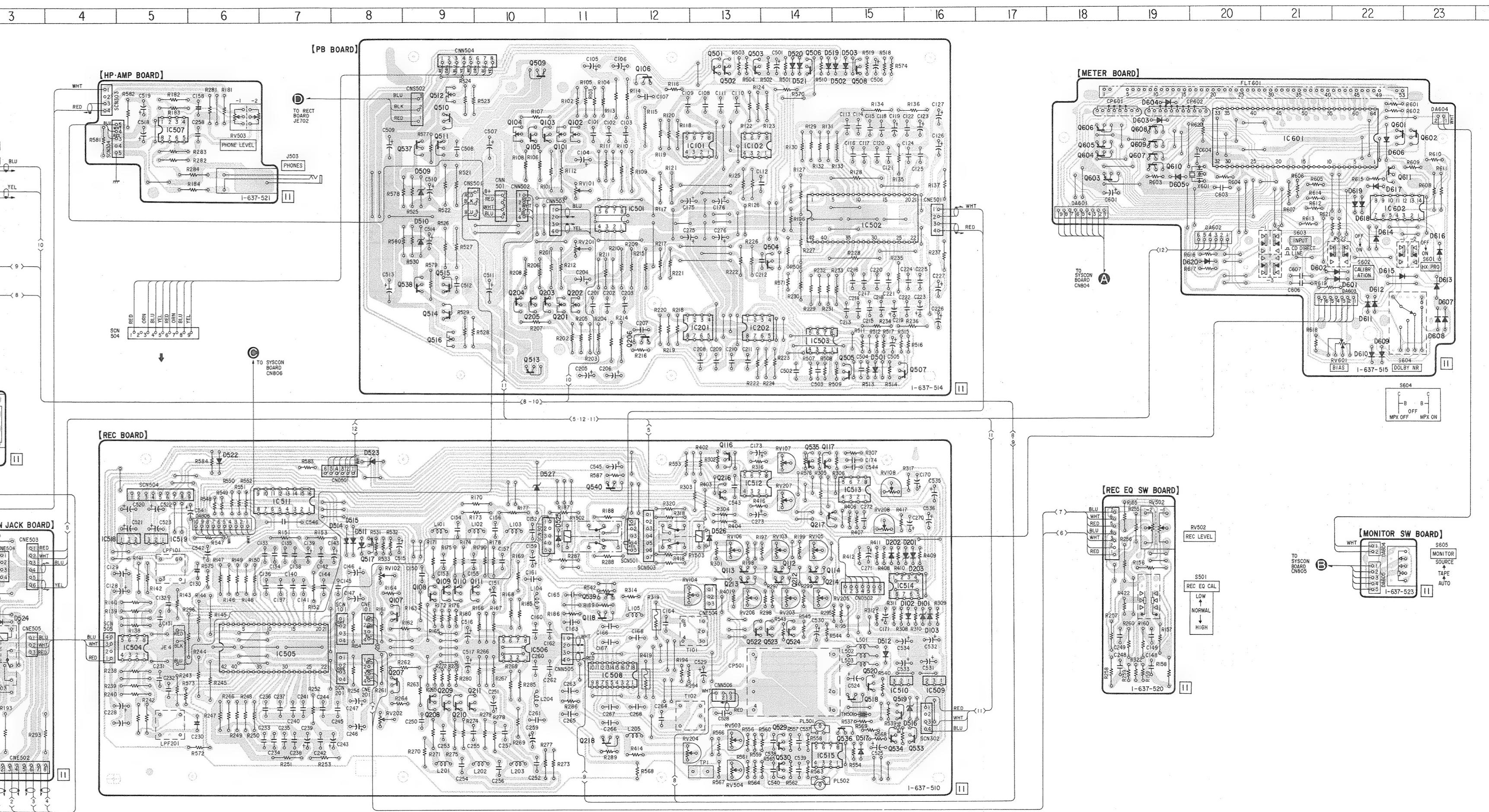
## 4-6. PRINTED WIRING BOARDS - AUDIO SECTION -

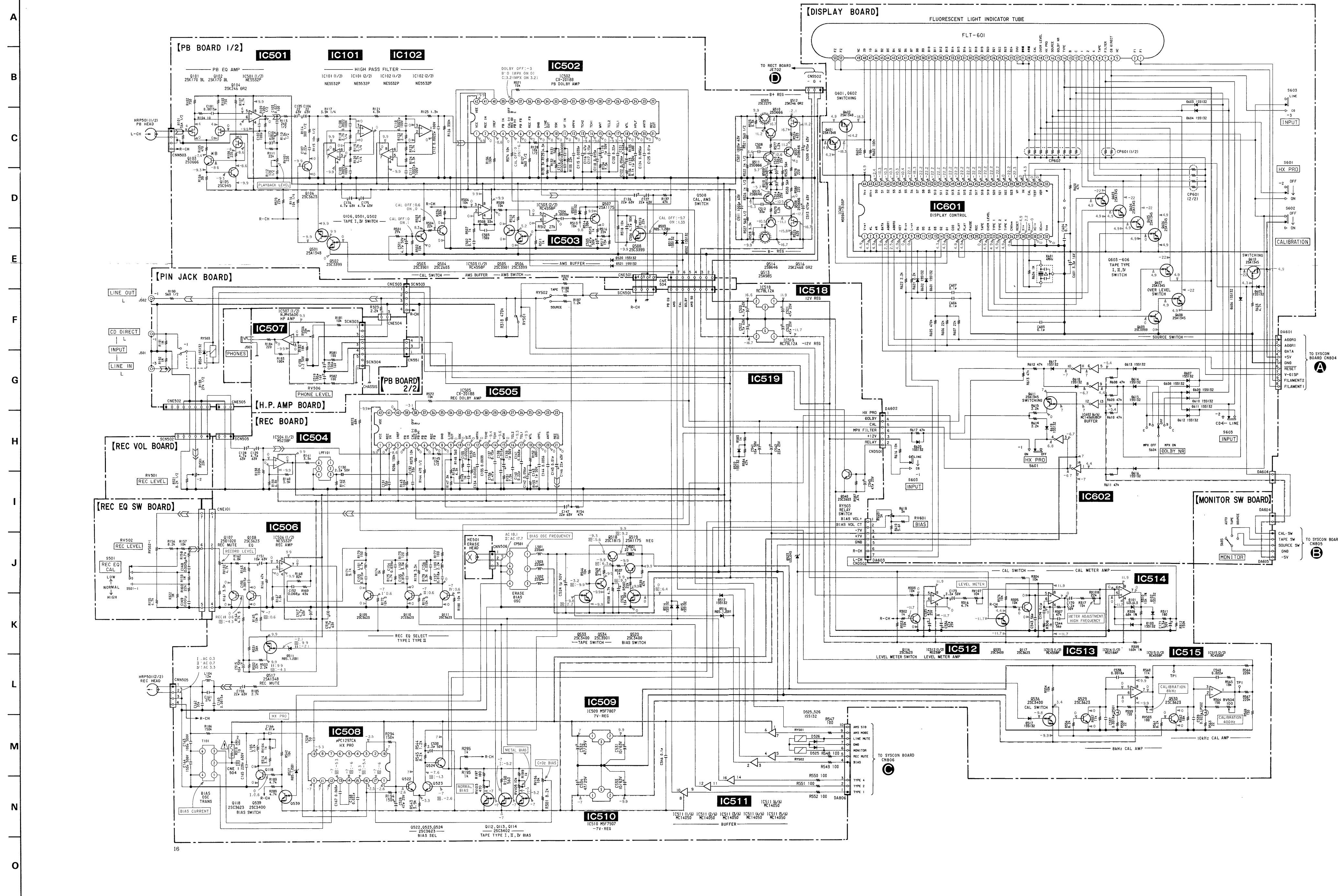
## • Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D101	I-16	Q105	B-10
D102	I-16	Q106	A-12
D103	I-16	Q107	I-8
D201	H-15	Q108	H-9
D202	H-15	Q109	H-9
D203	H-16	Q110	H-9
D501	E-15	Q111	H-9
D502	A-15	Q112	H-14
D503	A-15	Q113	H-13
D509	C-9	Q114	H-14
D510	C-9	Q116	G-13
D511	H-8	Q117	G-14
D512	I-15	Q118	I-11
D514	H-8	Q201	D-11
D515	H-8	Q202	D-11
D516	J-16	Q203	D-10
D517	K-15	Q204	D-10
D519	A-14	Q205	D-10
D520	A-14	Q206	E-12
D521	A-14	Q207	J-8
D522	G-6	Q208	J-9
D523	G-8	Q209	J-9
D524	I-3	Q210	J-9
D525	H-11	Q211	J-9
D526	H-13	Q212	H-14
D527	G-10	Q213	H-13
D601	D-22	Q214	H-14
D602	D-22	Q216	G-13
D603	B-19	Q217	G-14
D604	B-19	Q218	J-11
D605	C-19	Q501	A-13
D606	B-22	Q502	A-13
D607	E-23	Q503	A-13
D608	E-23	Q504	D-14
D609	E-22	Q505	E-15
D610	E-22	Q506	A-14
D611	D-22	Q507	A-15
D612	D-22	Q508	A-15
D613	D-23	Q509	A-10
D614	C-22	Q510	B-9
D615	D-22	Q511	B-9
D616	D-23	Q512	A-9
D617	C-22	Q513	E-10
D618	C-22	Q514	D-9
D619	C-22	Q515	D-9
D620	D-20	Q516	E-9
IC101	B-13	Q517	H-8
IC102	B-13	Q518	J-15
IC201	E-13	Q519	J-15
IC202	E-13	Q520	I-15
IC501	C-11	Q522	I-13
IC502	C-15	Q523	I-14
IC503	E-14	Q524	I-14
IC504	I-5	Q529	J-14
IC505	I-7	Q530	K-14
IC506	I-10	Q533	J-16
IC507	B-5	Q534	J-15
IC508	J-11	Q535	G-14
IC509	J-16	Q537	B-9
IC510	J-15	Q538	D-9
IC511	G-7	Q539	H-11
IC512	G-13	Q540	G-11
IC513	G-13	Q601	B-22
IC514	H-15	Q602	B-23
IC515	K-14	Q603	B-18
IC518	H-5	Q604	B-18
IC519	H-5	Q605	B-18
IC601	B-21	Q606	B-18
IC602	C-22	Q607	B-19
Q101	B-11	Q608	B-19
Q102	B-11	Q609	B-19
Q103	B-10	Q610	B-19
Q104	B-10	Q611	B-22

Note on Mounting Diagram:

- — : parts extracted from the component side.
- ■ : parts mounted on the conductor side.





**Note on Schematic Diagram:**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF:  $\mu\mu\text{F}$

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ ,  $\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.
  - All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
  - Components for right channel have same values as for left channel. Reference numbers are coded from 200, 400.
  - $\triangle$  : internal component.
  -  : nonflammable resistor.

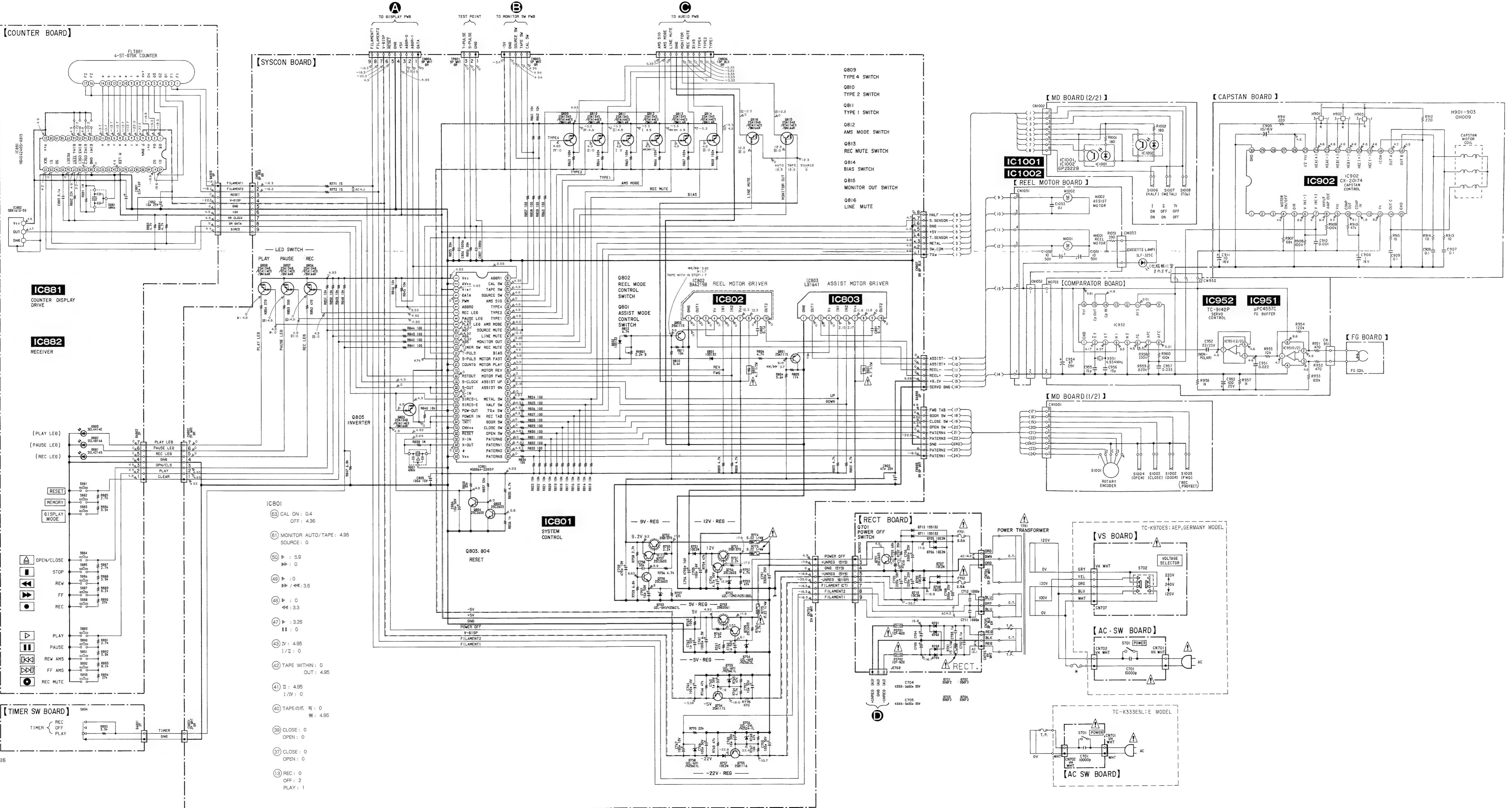
**Note:** The components identified by mark  or dotted line with mark  are critical for safety.  
Replace only with part number specified.

- Replace only with part number specified.

  -  : B+ Line
  -  : B- Line
  -  : adjustment for repair.
  - Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  - no mark: STOP
 

	: PLAY		: PAUSE		: NORMAL TAPE
	: REC		: CrO <sub>2</sub> TAPE		
	: FF		: METAL TAPE		
	: REW				
  - Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
  - Signal path.
 

	: PB (DECK A)
	: REC (DECK A)

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O

Note on Schematic Diagram:

- All capacitors are in  $\mu\text{F}$  unless otherwise noted, pF:  $\mu\text{F}$  50W or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200, 400.
- $\triangle$ : internal component.
- $\square$ : nonflammable resistor.
- $\text{---}$ : fusible resistor.

Note: The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety. Replace only with part number specified.

•  $\square$  : B+ Line  
 $\square$  : B- Line  
 $\square$  : adjustment for repair.

• Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.

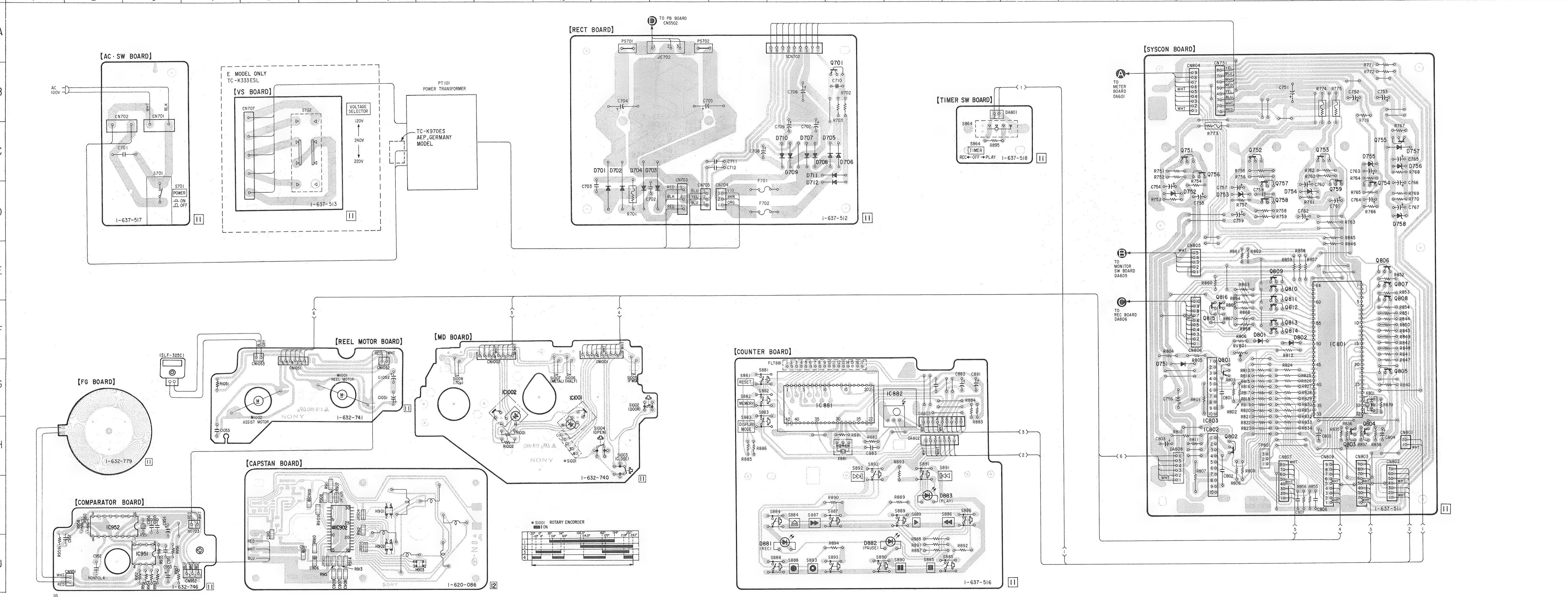
no mark : STOP       $\square$  : PLAY       $\square$  : PAUSE  
 $\square$  : REC       $\square$  : CO, TAPE  
 $\square$  : FF       $\square$  : NORMAL TAPE  
 $\square$  : REV       $\square$  : METAL TAPE

• Voltages are taken with a VOM (Input impedance  $10\text{M}\Omega$ )  
Voltage variations may be noted due to normal production tolerances.

• Signal path.  
 $\square$  : PB (DECK A)  
 $\square$  : REC (DECK A)

## - 9. PRINTED WIRING BOARDS - SYSCON SECTION -

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27



• Semiconductor Location	
Ref. No.	Location
D701	D-11
D702	D-11
D703	D-12
D704	D-11
D705	C-15
D706	C-15
D707	C-14
D708	C-14
D709	C-14
D710	C-14
D711	C-15
D712	D-15
D751	G-20
D752	D-20
D753	D-22
D754	D-23
D755	C-24
D756	C-24
D757	C-24
D758	D-24
D801	F-22
D802	F-22
D881	J-14
D882	J-15
D883	I-16
IC801	F-23
IC802	H-21
IC803	G-21
IC881	G-14
IC882	G-16
IC902	I-6
IC951	J-3
IC952	I-2
IC1001	G-10
IC1002	G-9
Q701	B-15
Q751	C-21
Q752	C-22
Q753	C-23
Q754	D-24
Q755	C-24
Q756	C-21
Q757	D-22
Q758	D-22
Q759	D-23
Q801	G-21
Q802	H-21
Q803	H-23
Q804	H-24
Q805	G-24
Q806	E-24
Q807	E-24
Q808	F-24
Q809	E-22
Q810	E-22
Q811	F-22
Q812	F-22
Q813	F-22
Q814	F-22
Q815	F-21
Q816	E-21

#### Note on Mounting Diagram:

**—** : parts extracted from the component side

## SECTION 5

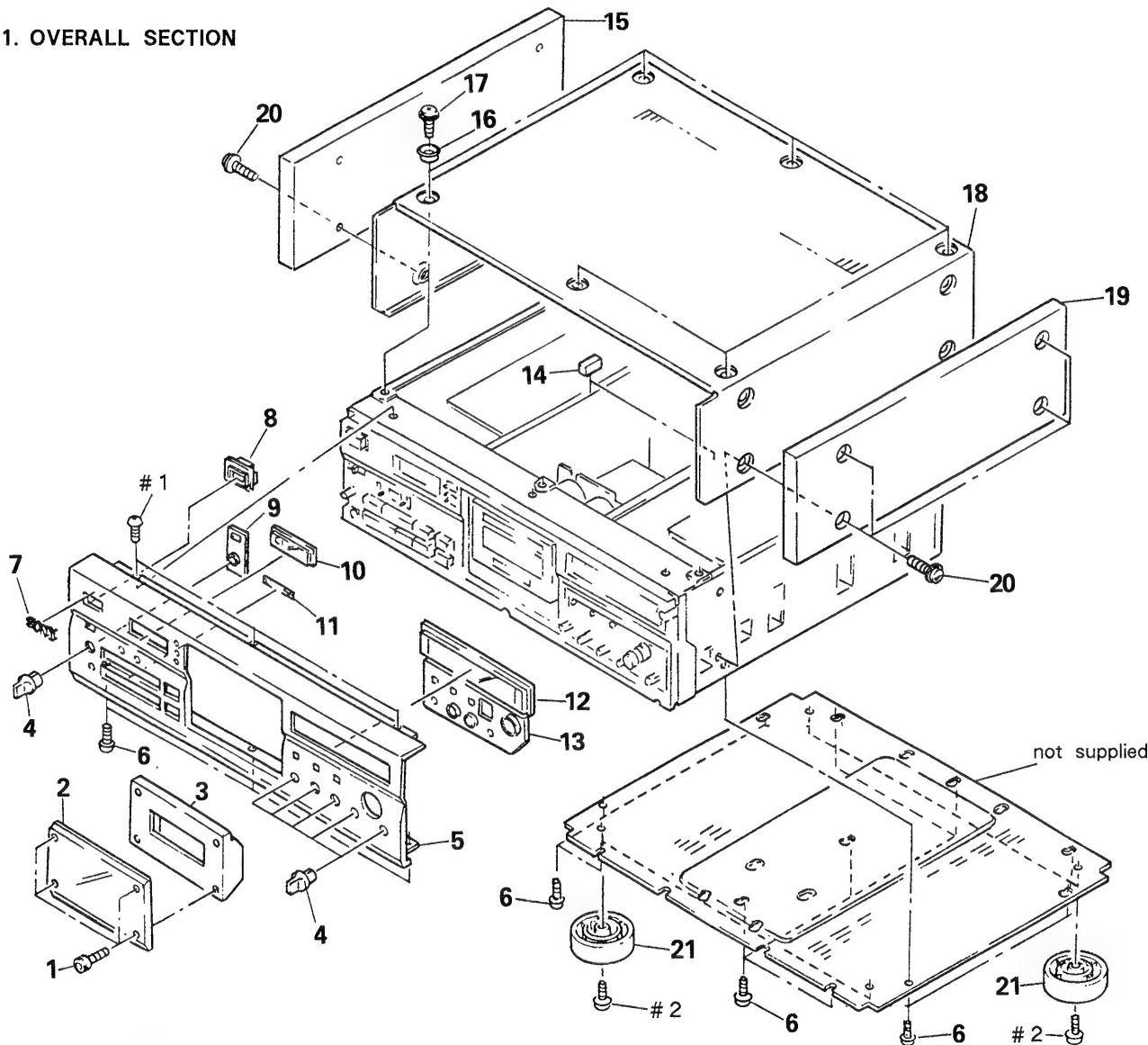
### EXPLODED VIEWS

**NOTE :**

- - XX, - X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts Example :  
KNOB, BALANCE (WHITE)...(RED)  
 ↑                      ↑  
 Parts color   Cabinet's color

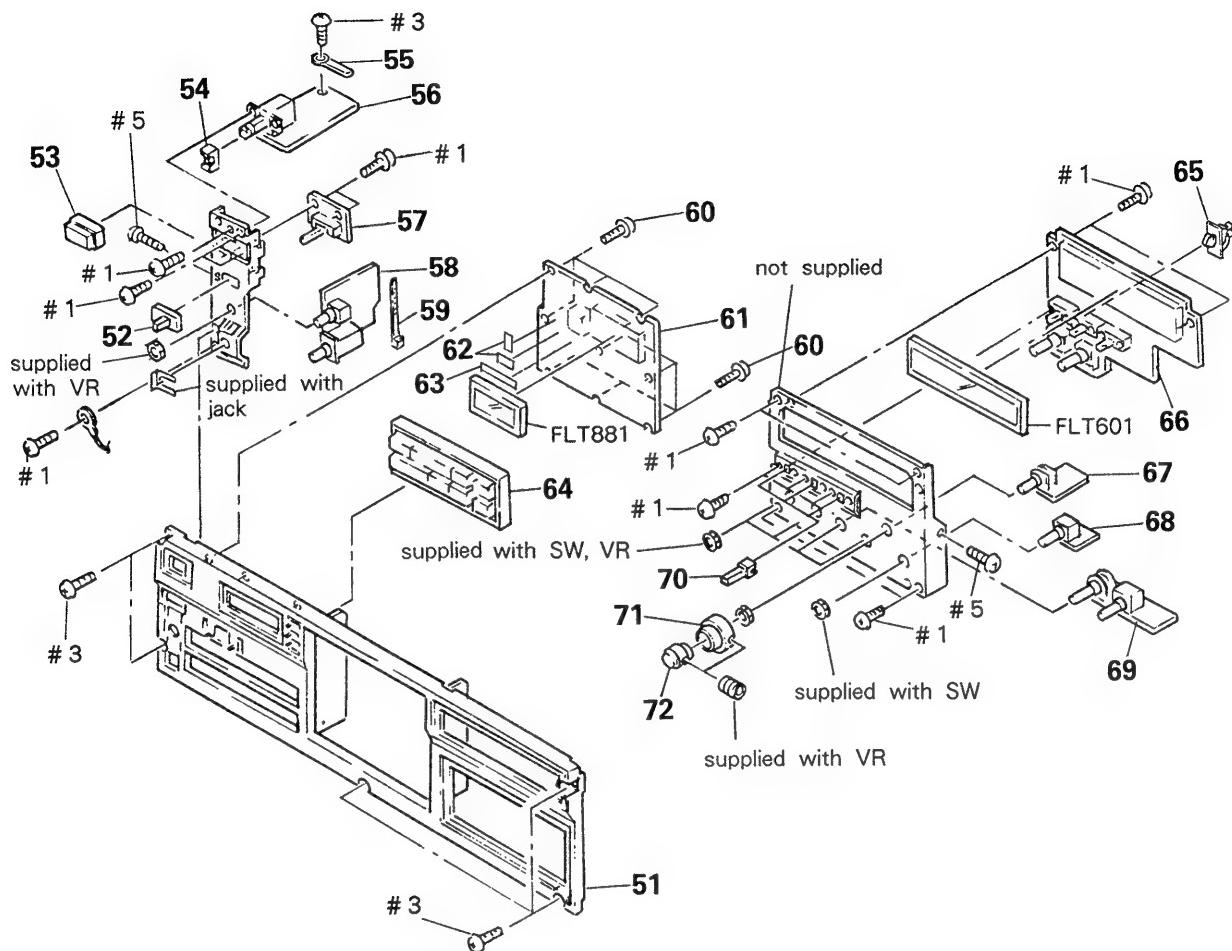
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety.  
Replace only with part number specified.

**5-1. OVERALL SECTION**

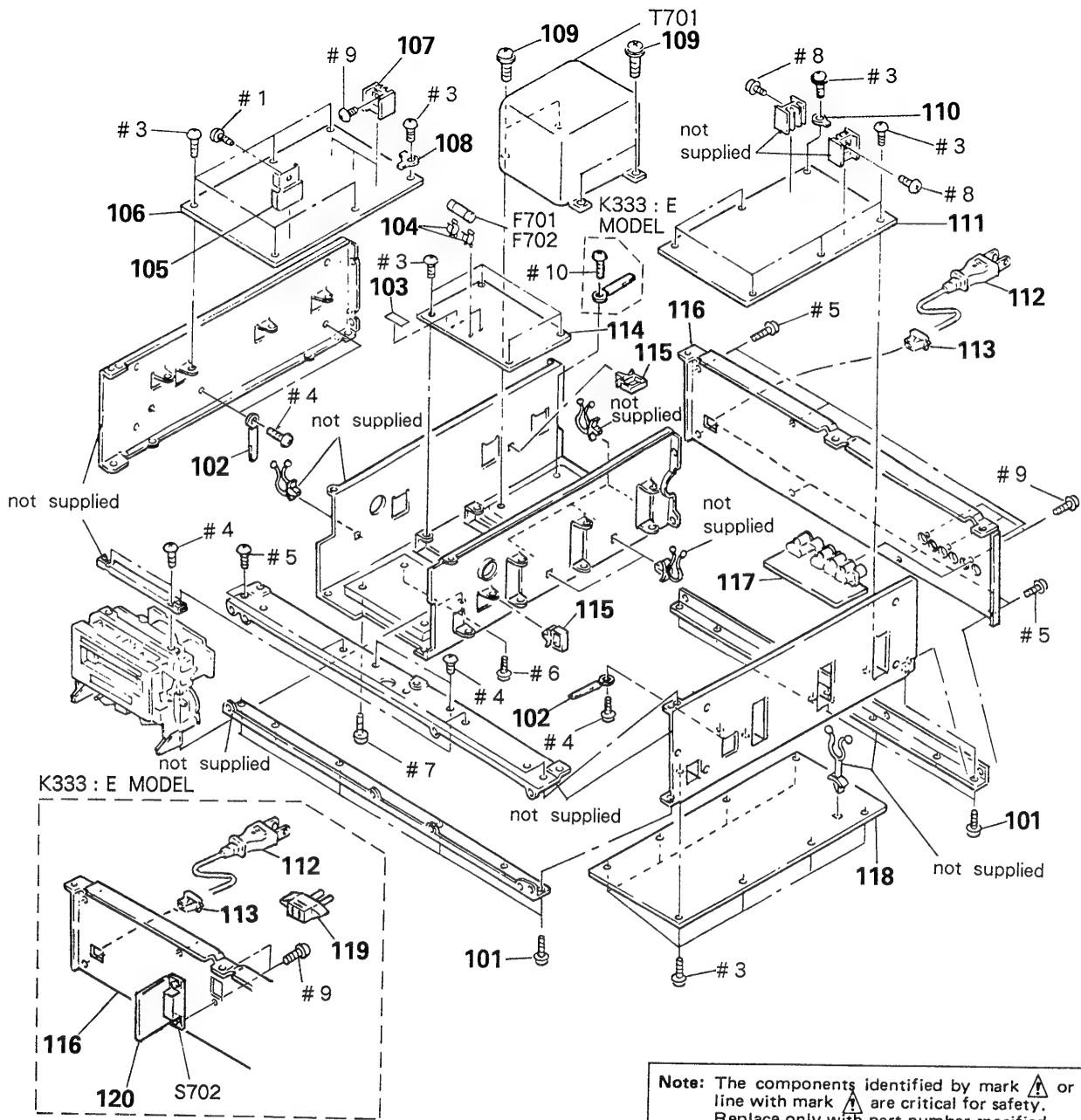
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-356-942-01	SCREW (2.6X6), TAPPING		12	3-364-443-01	WINDOW, METER	
2	3-364-438-21	WINDOW, CASSETTE		13	3-364-447-01	ESCUTCHEON (R)	
3	3-356-923-01	LID, CASSETTE		14	9-911-842-XX	CUSHION (S)	
4	X-3362-818-1	KNOB (DIA. 12) ASSY (B), SQUARE		15	X-3304-959-1	PANEL (LEFT) ASSY, SIDE	
5	3-364-475-31	PANEL, FRONT		16	4-923-474-01	RING, ORNAMENTAL	
6	3-703-685-21	SCREW (+BV 3X8)		17	3-704-366-01	SCREW (CASE) (M3X8)	
7	4-908-848-01	EMBLEM, SONY		18	* 3-350-489-11	CASE	
8	4-908-044-11	ESCUTCHEON, POWER KNOB		19	X-3304-960-1	PANEL (RIGHT) ASSY, SIDE	
9	3-364-444-01	ESCUTCHEON (L)		20	4-885-979-11	SCREW (4X25)	
10	3-364-442-11	WINDOW, COUNTER		21	X-3304-944-1	FOOT ASSY	
11	3-831-441-XX	PAPER, INTERCEPTION					

## 5-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	* 3-364-474-01	PANEL (BASE)		62	3-831-441-XX	SPACER	
52	4-922-518-11	KNOB (TIMER)		63	3-831-441-11	SPACER	
53	4-908-046-01	KNOB, SQUARE		64	X-3362-327-1	BUTTON ASSY	
54	4-864-307-00	RING		65	2-132-434-01	CLIP, WIRE	
55	3-703-150-11	STOPPER, WIRING		66	* A-2006-355-A	METER BOARD	
56	* 1-637-517-11	AC SW BOADR		67	* 1-637-519-11	REC VOL BOARD	
	* 1-637-518-11	TIMER SW BOARD		68	* 1-637-523-11	MONITOR SW BOARD	
57	* 1-637-521-11	H. P. AMP BOARD		69	* 1-637-520-11	REC EQ SW BOARD	
58	3-655-653-21	BAND (TAITON), BINDING		70	3-364-441-01	BUTTON	
59	4-928-635-01	SCREW, +BV (2.6X8) TAPPING		71	3-364-440-01	KNOB (L)	
60	* 1-637-516-11	COUNTER BOARD		72	3-364-439-01	KNOB (R)	

### 5-3. CHASSIS SECTION

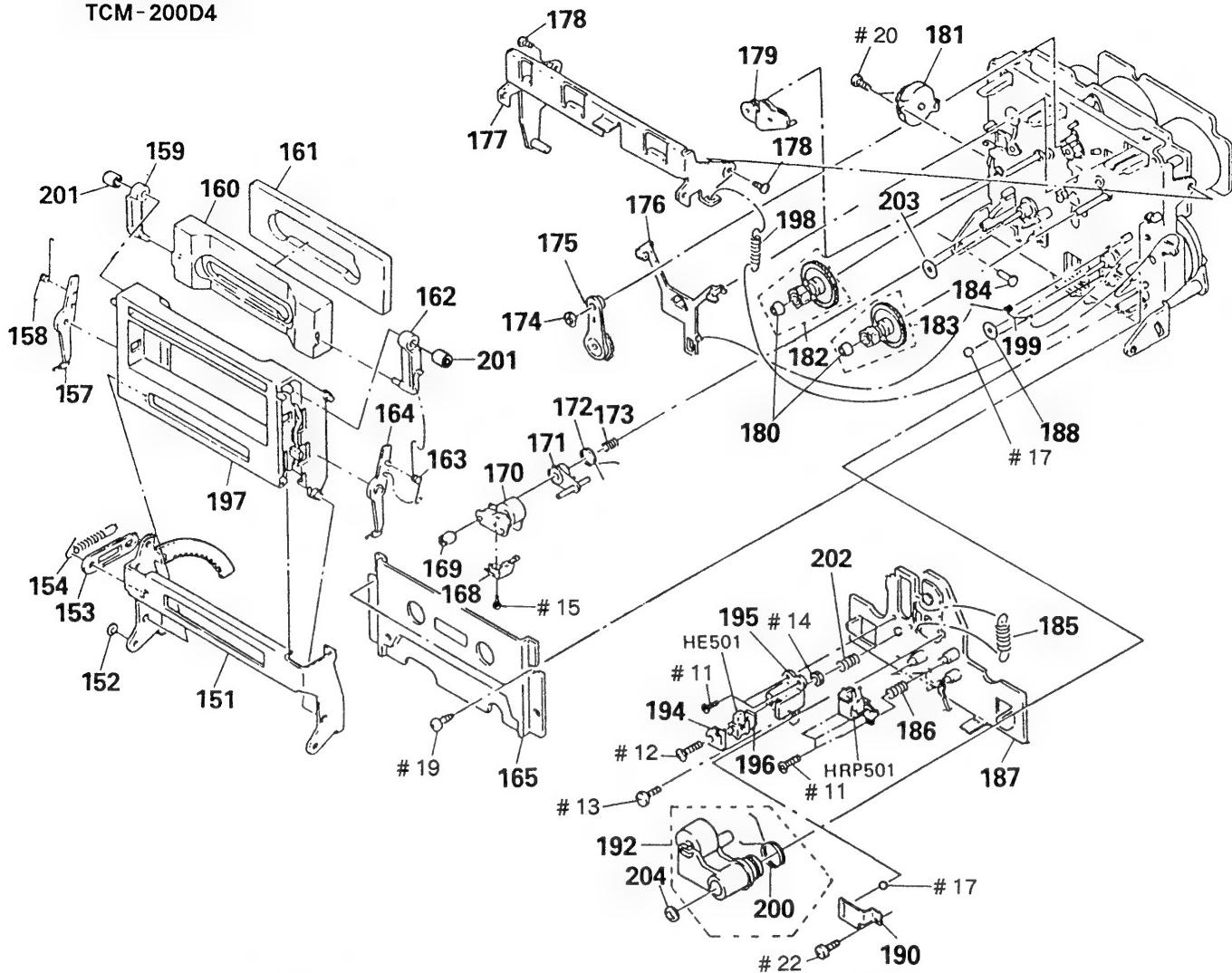


Note: The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-703-685-21	SCREW (+BV 3X8)		114	* 1-637-512-11	RECT. BOARD	
102	3-703-150-11	STOPPER, WIRING		115	* 3-329-937-02	CLIP, WIRE	
103	3-701-947-15	LABEL (T2.5A), FUSE		116	* 3-350-482-21	PANEL, BACK (K970ES)	
104	* 1-533-213-31	HOLDER, FUSE		117	* 3-350-482-31	PANEL, BACK (K333ESL:E)	
105	* 3-356-925-01	HEAT SINK		118	* 1-637-522-11	PIN JACK BOARD	
106	* A-2006-354-A	SYSCON BOARD		119	A-2006-353-A	REC BOARD	
107	* 4-363-146-21	HEAT SINK, V. OUT		120	△1-569-007-11	ADAPTER, CONVERSION 2P (K333ESL:E)	
108	* 3-346-266-12	PLATE, GROUND		F701	△1-532-286-00	V. S BOARD (K333ESL:E)	
109	4-820-330-31	SCREW (K970ES)		F702	△1-532-286-00	FUSE, TIME-LAG (2.5A)	
	4-886-821-11	+PTTWH 3X6(S) (K333ESL:E)		S702	△1-157-009-11	FUSE, TIME-LAG (2.5A)	
110	3-346-266-21	PLATE, GROUND		T701	△1-450-451-11	SELECTOR, VOLTAGE (K333ESL:E)	
111	A-2006-364-A	PB BOARD			△1-450-453-11	TRANSFORMER, POWER (K970ES)	
112	△1-574-383-11	CORD, POWER (K970ES)				TRANSFORMER, POWER (K333ESL:E)	
113	△1-559-297-32	CORD, POWER (K333ESL:E)					
	* 3-703-244-00	BUSHING (2104), CORD (K970ES)					
	* 4-916-783-01	BUSHING, CORD (K333ESL:E)					

5-4. MECHANISM SECTION-1

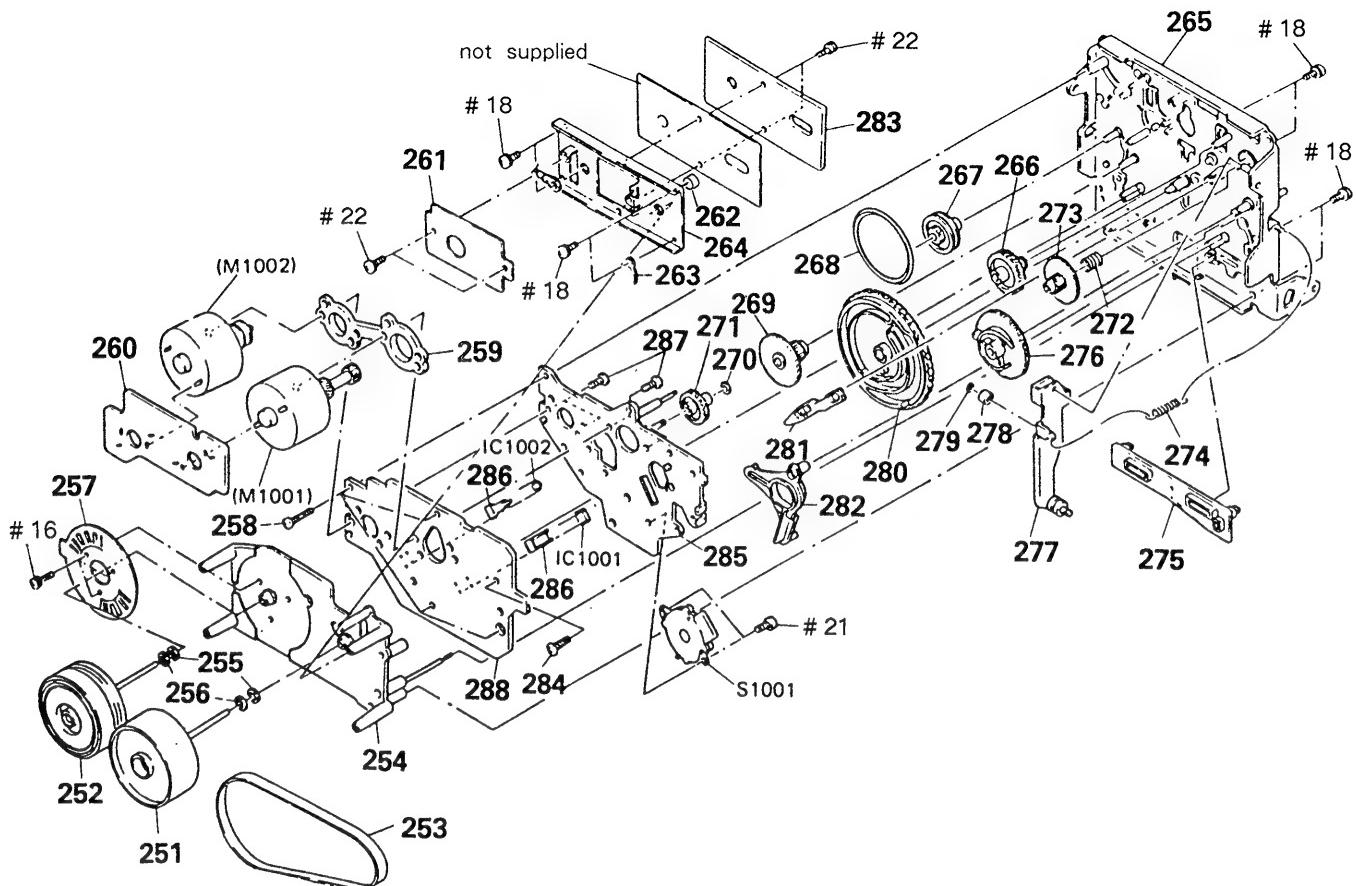
TCM-200D4



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	X-3362-671-1	HOLDER (BG) ASSY, CASSETTE		179	X-3356-623-1	LEVER (BT) ASSY	
152	3-558-708-21	WASHER, STOPPER		180	3-362-308-01	CAP (REEL)	
153	* 3-356-717-01	LEVER (JOINT)		181	3-319-224-31	DAMPER, SMALL	
154	3-356-626-01	SPRING, TENSION		182	X-3356-629-1	GEAR (S) ASSY	
157	3-356-932-01	LEVER (LA)		183	X-3356-627-1	GEAR (T) ASSY	
158	3-356-927-01	SPRING (LEFT), TORSION		184	3-356-710-01	SHAFT (LEFT) (CASSETTE HOLDER)	
159	3-356-933-01	LEVER (LB)		185	3-356-658-01	SPRING (LIMITER H), TENSION	
160	3-356-928-01	PLATE (A), ORNAMENTAL		187	* X-3362-199-1	SLIDER (HEAD CHASSIS D) ASSY	
161	* 3-356-929-01	ABSORBENT, VIBRATION		188	3-332-763-01	RING, OIL RESERVOIR	
162	3-356-931-01	LEVER (RB)		190	3-356-656-01	SPRING (HEAD PC BOARD), LEAF	
163	3-356-926-01	SPRING (RIGHT), TORSION		192	X-3356-620-1	LEVER (PINCH LEVER T) ASSY	
164	3-356-930-01	LEVER (RA)		194	3-318-433-01	SPRING	
165	X-3356-613-1	PLATE ASSY, ORNAMENTAL (INCLUDED. SLF-325C)		195	* 3-576-977-00	BRACKET, E. HEAD	
166	3-564-138-00	GUIDE (S), TAPE		196	* 1-608-268-00	PC BOARD, ERASE HEAD	
169	3-356-652-01	NUT (PINCH LEVER S)		197	X-3356-611-1	HOLDER (A) ASSY, CASSETTE	
170	X-3356-621-1	LEVER (PINCH LEVER S) ASSY		198	3-356-624-01	SPRING, TENSION	
171	3-356-660-01	LEVER (PS)		199	3-356-619-01	SPRING (B), TORSION	
172	3-356-661-01	SPRING (PINCH LEVER S), TORSION		200	3-356-672-01	SPRING (PINCH LEVER T), TORSION	
173	3-356-657-01	SPRING (PS), COMPRESSION		201	3-356-946-01	BUSHING	
174	3-669-465-00	WASHER (1.5), STOPPER		202	3-564-121-00	SPRING, COMPRESSION	
175	X-3356-641-1	LEVER (FR2) ASSY		203	3-356-713-01	WASHER	
176	3-356-614-01	SLIDER (BRAKE)		204	3-669-596-00	WASHER (2.3), STOPPER	
177	* X-3356-608-1	LEVER (LIFTER) ASSY		HE501	1-543-358-11	HEAD, MAGNETIC (ERASE)	
178	3-356-601-11	SCREW, STEP		HRP501	1-543-684-11	HEAD, MAGNETIC (REC/PB)	

## **5 - 5. MECHANISM SECTION - 2**

### **TCM - 200D4**



<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
251	X-3362-284-1	FLYWHEEL (S2.3) ASSY		272	3-356-605-01	SPRING, COMPRESSION	
252	X-3356-619-1	FLYWHEEL (DT) ASSY		273	3-356-609-01	GEAR (LOADING)	
253	3-364-600-01	BELT (CAPSTAN)		274	3-356-625-01	SPRING, TENSION	
254	X-3362-281-1	CHASSIS (D2.3) ASSY		275	3-356-653-01	SLIDER (PAUSE)	
255	3-356-705-31	WASHER (CAPSTAN)		276	3-356-616-01	GEAR (LOADING CAM)	
256	3-356-705-21	WASHER (CAPSTAN)		277	* X-3356-606-1	LEVER (LOADING) ASSY	
257	1-632-779-11	PC BOARD, FG		278	3-356-630-01	ROLLER (LOADING)	
258	3-355-801-01	SCREW (BTP 2X18)		279	3-558-708-11	WASHER, STOPPER	
259	* 3-356-628-01	SPACER (MOTOR)		280	3-356-654-01	GEAR (MODE CAM C)	
260	* 1-632-741-11	REEL MOTOR BOARD		281	3-356-617-01	LEVER (SELECTION)	
261	* 1-632-746-11	COMPARATOR BOARD		282	3-356-613-01	LEVER (MODE)	
262	3-364-135-01	RETAINER (S), THRUST		283	A-2006-154-A	CAPSTAN C. O. C BOARD	
263	* 3-701-822-00	HOLDER, WIRE		284	3-356-707-01	SCREW (+PTPWH 2X25)	
264	* X-3362-282-1	BRACKET (THRUST RETAINER) ASSY		285	* X-3356-616-4	BRACKET (MOTOR D) ASSY	
265	X-3356-622-1	CHASSIS (C) ASSY, MECHANICAL		286	3-356-631-01	HOLDER (SENSOR)	
266	3-356-703-01	GEAR (COMMUNICATION C)		287	3-363-804-01	SCREW (+P 2.6X6.5)	
267	3-356-607-01	PULLEY (MODE)		288	* 1-632-740-11	MD BOARD	
268	3-356-603-01	BELT (MODE)		IC1001	1-506-615-11	PIN, CONNECTOR 9P	
269	3-356-606-01	GEAR (MODE)		IC1002	1-564-501-11	PIN, CONNECTOR 8P	
270	3-669-465-00	WASHER (1.5), STOPPER		M1001	X-3356-638-1	MOTOR (REEL R) ASSY	
271	3-356-702-01	GEAR (COMMUNICATION B)		M1002	X-3356-604-1	MOTOR (ASSIST) ASSY	
				S1001	1-466-238-11	ENCODER ROTARY	

## CAPSTAN C.O.C

## COMPARATOR MD

## NOTE :

The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety.  
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SECTION 6  
ELECTRICAL PARTS LIST

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- - XX, - X mean standardized parts, so they may have some difference from the original one.
- RESISTORS  
All resistors are in ohms.  
METAL : metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F : nonflammable
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS  
In each case, u : for example :  
uA... :  $\mu$ A..., uPA... ,  $\mu$ PA... ,  
uPB... ,  $\mu$ PB... , uPC... ,  $\mu$ PC... ,  
uPD... ,  $\mu$ PD...
- CAPACITORS :  
uF :  $\mu$ F
- COILS  
uH :  $\mu$ H

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark	
	A-2006-154-A	CAPSTAN C. O. C BOARD *****				< IC >		
		< CAPACITOR >		IC951	8-759-945-58	IC RC4558P		
				IC952	8-759-201-58	IC TC9142P		
C905	1-124-779-00	ELECT CHIP	10uF	20%	16V		< RESISTOR >	
C906	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	R951	1-249-413-11	CARBON 470 5% 1/4W
C907	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	R952	1-249-413-11	CARBON 470 5% 1/4W
C908	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	R953	1-247-881-00	CARBON 120K 5% 1/4W
C909	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	R954	1-247-881-00	CARBON 120K 5% 1/4W
C910	1-163-205-00	CERAMIC CHIP	0.001uF	5%	50V	R955	1-249-429-11	CARBON 10K 5% 1/4W
C911	1-124-779-00	ELECT CHIP	10uF	20%	16V	R956	1-249-417-11	CARBON 1K 5% 1/4W
						R957	1-249-417-11	CARBON 1K 5% 1/4W
H901	8-719-403-79	OH009-TW				R958	1-247-891-00	CARBON 330K 5% 1/4W
H902	8-719-403-79	OH009-TW				R959	1-247-901-11	CARBON 820K 5% 1/4W
H903	8-719-403-79	OH009-TW				R960	1-249-441-11	CARBON 100K 5% 1/4W
I902	8-752-017-40	IC CX20174					< VIBRATOR >	
				X951	1-577-615-11	VIBRATOR, CRYSTAL (4.934MHz)		
R907	1-216-242-00	METAL GLAZE	68K	5%	1/8W			
R908	1-216-246-00	METAL GLAZE	100K	5%	1/8W			
R909	1-216-246-00	METAL GLAZE	100K	5%	1/8W			
R910	1-216-238-00	METAL GLAZE	47K	5%	1/8W			
R911	1-216-182-00	METAL GLAZE	220	5%	1/8W			
R912	1-216-182-00	METAL GLAZE	220	5%	1/8W			
R913	1-216-150-00	METAL GLAZE	10	5%	1/8W			
R914	1-216-150-00	METAL GLAZE	10	5%	1/8W			
R915	1-216-150-00	METAL GLAZE	10	5%	1/8W			
						3-356-631-01	HOLDER (SENSOR)	
							< CONNECTOR >	
				CN1001	1-506-615-11	PIN, CONNECTOR 9P		
				CN1002	1-564-501-11	PIN, CONNECTOR 8P		
							< IC >	
* 1-632-746-11	COMPARATOR BOARD *****			IC1001	8-749-920-97	IC PHOTO REFLECTOR GP2S22B		
				IC1002	8-749-920-97	IC PHOTO REFLECTOR GP2S22B		
							< RESISTOR >	
C951	1-136-157-00	FILM	0.022uF	5%	50V	R1001	1-249-408-11	CARBON 180 5% 1/4W
C952	1-124-282-00	ELECT	22uF	20%	25V	R1002	1-249-408-11	CARBON 180 5% 1/4W
C953	1-124-478-11	ELECT	100uF	20%	25V			
C954	1-124-477-11	ELECT	47uF	20%	25V			
C955	1-162-203-31	CERAMIC	15PF	5%	50V			
							< SWITCH >	
C956	1-162-203-31	CERAMIC	15PF	5%	50V	S1002	1-570-953-11	SWITCH, PUSH (1 KEY) (DOOR)
C957	1-136-159-00	FILM	0.033uF	5%	50V	S1003	1-571-958-11	SWITCH, PUSH (1 KEY) (CLOSE)
						S1004	1-572-126-11	SWITCH, PUSH (1 KEY) (OPEN)
						S1005	1-572-125-11	SWITCH, LEAF (FWD)
						S1006	1-572-202-11	SWITCH, LEAF (HALF)
CN951	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P				S1007	1-572-125-11	SWITCH, LEAF (METAL)
CN952	* 1-564-518-11	PLUG, CONNECTOR 3P				S1008	1-572-125-11	SWITCH, LEAF (70U)

MD	REAL MOTOR	PB	COUNTER	AC SW	TIMER SW
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REC VOL	REC EQ SW	H.P. AMP	PIN JACK	MONITOR SW
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Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
< PIN >											
TB1001	* 1-569-066-11	PIN, CONNECTOR 5P				C107	1-136-169-00	FILM	0.22uF	5%	50V
						C108	1-136-230-00	FILM	0.0022uF	5%	100V
						C109	1-136-230-00	FILM	0.0022uF	5%	100V
						C110	1-136-230-00	FILM	0.0022uF	5%	100V
*****											
	* 1-632-741-11	REAL MOTOR BOARD				C111	1-136-230-00	FILM	0.0022uF	5%	100V
		*****				C112	1-136-230-00	FILM	0.0022uF	5%	100V
						C113	1-130-475-00	MYLAR	0.0022uF	5%	50V
						C114	1-130-475-00	MYLAR	0.0022uF	5%	50V
						C115	1-130-478-00	MYLAR	0.0039uF	5%	50V
< CAPACITOR >											
C1051	1-124-907-11	ELECT	10uF	20%	50V	C116	1-136-173-00	FILM	0.47uF	5%	50V
C1052	1-124-907-11	ELECT	10uF	20%	50V	C117	1-136-167-00	FILM	0.15uF	5%	50V
C1053	1-164-159-11	CERAMIC	0.1uF		50V	C118	1-136-155-00	FILM	0.015uF	5%	50V
						C119	1-123-380-00	ELECT	1uF	20%	50V
						C120	1-136-169-00	FILM	0.22uF	5%	50V
< CONNECTOR >											
CN1051	* 1-564-499-11	PIN, CONNECTOR 6P				C121	1-136-163-00	FILM	0.068uF	5%	50V
CN1052	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P				C122	1-136-162-00	FILM	0.056uF	5%	50V
CN1053	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P				C123	1-123-380-00	ELECT	1uF	20%	50V
						C124	1-130-480-00	MYLAR	0.0056uF	5%	50V
						C125	1-136-153-00	FILM	0.01uF	5%	50V
< RESISTOR >											
R1051	1-249-412-11	CARBON	390	5%	1/4W	C126	1-124-929-11	ELECT	22uF	20%	100V
						C127	1-124-929-11	ELECT	22uF	20%	100V
						C148	1-106-347-00	MYLAR	1500PF	5%	200V
						C149	1-106-343-00	MYLAR	1000PF	5%	200V
						C158	1-124-767-00	ELECT	2.2uF	20%	50V
*****											
	* A-2006-364-A	PB BOARD				C175	1-123-369-00	ELECT	4.7uF	20%	63V
		*****				C176	1-123-369-00	ELECT	4.7uF	20%	63V
	* 1-637-516-11	COUNTER BOARD				C201	1-136-252-00	FILM	0.0015uF	5%	100V
		*****				C202	1-107-169-00	MICA	100PF	5%	500V
						C203	1-130-893-00	FILM	0.027uF	3%	100V
	* 1-637-517-11	AC SW BOARD				C204	1-124-130-00	ELECT	100uF	20%	63V
		*****				C205	1-124-929-11	ELECT	22uF	20%	100V
	* 1-637-518-11	TIMER SW BOARD				C206	1-124-929-11	ELECT	22uF	20%	100V
		*****				C207	1-136-169-00	FILM	0.22uF	5%	50V
						C208	1-136-230-00	FILM	0.0022uF	5%	100V
	* 1-637-519-11	REC VOL BOARD				C209	1-136-230-00	FILM	0.0022uF	5%	100V
		*****				C210	1-136-230-00	FILM	0.0022uF	5%	100V
	* 1-637-520-11	REC EQ SW BOARD				C211	1-136-230-00	FILM	0.0022uF	5%	100V
		*****				C212	1-136-230-00	FILM	0.0022uF	5%	100V
						C213	1-130-475-00	MYLAR	0.0022uF	5%	50V
	* 1-637-521-11	H. P. AMP BOARD				C214	1-130-475-00	MYLAR	0.0022uF	5%	50V
		*****				C215	1-130-478-00	MYLAR	0.0039uF	5%	50V
	* 1-637-522-11	PIN JACK BOARD				C216	1-136-173-00	FILM	0.47uF	5%	50V
		*****				C217	1-136-167-00	FILM	0.15uF	5%	50V
						C218	1-136-155-00	FILM	0.015uF	5%	50V
	* 1-637-523-11	MONITOR SW BOARD				C219	1-123-380-00	ELECT	1uF	20%	50V
		*****				C220	1-136-169-00	FILM	0.22uF	5%	50V
						C221	1-136-163-00	FILM	0.068uF	5%	50V
	7-682-147-15	SCREW, TR				C222	1-136-162-00	FILM	0.056uF	5%	50V
	* 3-346-266-21	PLATE, GROUND				C223	1-123-380-00	ELECT	1uF	20%	50V
< CAPACITOR >											
C101	1-136-252-00	FILM	0.0015uF	5%	100V	C224	1-130-480-00	MYLAR	0.0056uF	5%	50V
C102	1-107-169-00	MICA	100PF	5%	500V	C225	1-136-153-00	FILM	0.01uF	5%	50V
C103	1-130-893-00	FILM	0.027uF	3%	100V	C226	1-124-929-11	ELECT	22uF	20%	100V
C104	1-124-130-00	ELECT	100uF	20%	63V	C227	1-124-929-11	ELECT	22uF	20%	100V
C105	1-124-929-11	ELECT	22uF	20%	100V	C248	1-106-347-00	MYLAR	1500PF	5%	200V
C106	1-124-929-11	ELECT	22uF	20%	100V	C249	1-106-343-00	MYLAR	1000PF	5%	200V
						C258	1-124-767-00	ELECT	2.2uF	20%	50V
						C275	1-123-369-00	ELECT	4.7uF	20%	63V
						C276	1-123-369-00	ELECT	4.7uF	20%	63V
						C501	1-124-927-11	ELECT	4.7uF	20%	100V

PB COUNTER AC SW TIMER SW REC VOL REC EQ SW

**H.P. AMP PIN JACK MONITOR SW**

Ref. No.	Part No.	Description			Remark		Ref. No.	Part No.	Description			Remark
C502	1-136-165-00	FILM	0.1uF	5%	50V		D605	8-719-107-94	DIODE	1SS202-1		
C503	1-162-284-31	CERAMIC	150PF	10%	50V		D606	8-719-107-94	DIODE	1SS202-1		
C504	1-130-478-00	MYLAR	0.0039uF	5%	50V		D607	8-719-107-94	DIODE	1SS202-1		
C505	1-124-902-00	ELECT	0.47uF	20%	50V		D608	8-719-107-94	DIODE	1SS202-1		
C506	1-124-927-11	ELECT	4.7uF	20%	100V		D609	8-719-107-94	DIODE	1SS202-1		
C507	1-124-922-11	ELECT	1000uF	20%	63V		D610	8-719-107-94	DIODE	1SS202-1		
C508	1-107-159-00	MICA	33PF	5%	500V		D611	8-719-107-94	DIODE	1SS202-1		
C509	1-126-066-11	ELECT	470uF	20%	63V		D612	8-719-107-94	DIODE	1SS202-1		
C510	1-124-122-11	ELECT	100uF	20%	50V		D613	8-719-107-94	DIODE	1SS202-1		
C511	1-124-922-11	ELECT	1000uF	20%	63V		D614	8-719-107-94	DIODE	1SS202-1		
C512	1-107-159-00	MICA	33PF	5%	500V		D615	8-719-107-94	DIODE	1SS202-1		
C513	1-126-066-11	ELECT	470uF	20%	63V		D616	8-719-107-94	DIODE	1SS202-1		
C514	1-124-122-11	ELECT	100uF	20%	50V		D617	8-719-107-94	DIODE	1SS202-1		
C518	1-124-122-11	ELECT	100uF	20%	50V		D618	8-719-107-94	DIODE	1SS202-1		
C519	1-124-122-11	ELECT	100uF	20%	50V		D619	8-719-107-94	DIODE	1SS202-1		
C601	1-131-368-00	TANTALUM	3.3uF	10%	16V		D620	8-719-107-94	DIODE	1SS202-1		
C603	1-164-159-11	CERAMIC	0.1uF		50V		D881	8-719-304-32	DIODE	SEL4214S-C		
C604	1-164-159-11	CERAMIC	0.1uF		50V		D882	8-719-312-65	DIODE	SEL4814A-CD		
C606	1-164-159-11	CERAMIC	0.1uF		50V		D883	8-719-304-37	DIODE	SEL4414E-C		
C607	1-164-159-11	CERAMIC	0.1uF		50V							< FLUORESCENT INDICATOR >
C701	1-161-744-00	CERAMIC	0.01uF		400V							
C881	1-124-234-00	ELECT	22uF	20%	16V		FLT601	1-519-629-11	INDICATOR TUBE, FLUORESCENT			
C882	1-126-096-11	ELECT	10uF	20%	35V		FLT881	1-519-630-11	INDICATOR TUBE, FLUORESCENT			
C883	1-164-159-11	CERAMIC	0.1uF		50V							< IC >
		< CONNECTOR >										
CN598	* 1-560-061-00	PIN, CONNECTOR 3P					IC101	8-759-900-72	IC	NE5532P		
CN599	* 1-560-061-00	PIN, CONNECTOR 3P					IC102	8-759-900-72	IC	NE5532P		
CN701	* 1-564-321-00	PIN, CONNECTOR 2P					IC201	8-759-900-72	IC	NE5532P		
CN702	* 1-564-321-00	PIN, CONNECTOR 2P					IC202	8-759-900-72	IC	NE5532P		
CNE501	* 1-564-507-11	PLUG, CONNECTOR 4P					IC501	8-759-900-72	IC	NE5532P		
CNE502	* 1-564-511-11	PLUG, CONNECTOR 8P					IC502	8-752-018-80	IC	CX20188		
CNE503	* 1-564-509-11	PLUG, CONNECTOR 6P					IC503	8-759-945-58	IC	RC4558P		
CNE504	* 1-564-507-11	PLUG, CONNECTOR 4P					IC507	8-759-511-57	IC	ADJ712JN-SK		
CNE505	* 1-564-506-11	PLUG, CONNECTOR 3P					IC601	8-759-635-68	IC	M50940-313SP		
CNN501	* 1-560-062-00	PIN, CONNECTOR 4P					IC602	8-759-240-69	IC	TC4069UBP		
CNN502	* 1-560-062-00	PIN, CONNECTOR 4P					IC881	8-759-322-98	IC	HD404240A31S		
CNN503	* 1-560-062-00	PIN, CONNECTOR 4P					IC882	8-741-100-48	IC	SBX1610-59		
CNN504	* 1-560-065-00	PIN, CONNECTOR 8P										< JACK >
CNS501	1-564-104-00	PIN, CONNECTOR 3P					J501	* 1-569-186-11	JACK, PIN 4P (LINE IN/CD DIRECTION)			
CNS502	1-564-104-00	PIN, CONNECTOR 3P					J502	* 1-568-250-21	JACK, PIN 2P (LINE OUT)			
		< COMPOSITION >					J503	1-507-796-71	JACK (PHONES)			
CP601	1-232-881-11	COMPOSITION CIRCUIT BLOCK										< TRANSISTOR >
CP602	1-236-985-11	COMPOSITION CIRCUIT BLOCK										
		< DIODE >										
D501	8-719-107-94	DIODE	1SS202-1				Q101	8-729-217-03	TRANSISTOR	2SK170-BL		
D502	8-719-107-94	DIODE	1SS202-1				Q102	8-729-217-03	TRANSISTOR	2SK170-BL		
D503	8-719-114-29	DIODE	RD5, 1JS-B1				Q103	8-729-375-61	TRANSISTOR	2SD660-C		
D509	8-719-910-65	DIODE	HZ6B2L				Q104	8-729-201-56	TRANSISTOR	2SK246-GR2		
D510	8-719-910-65	DIODE	HZ6B2L				Q105	8-729-194-57	TRANSISTOR	2SC945-P		
D519	8-719-107-94	DIODE	1SS202-1				Q106	8-729-141-30	TRANSISTOR	2SC3623A-LK		
D520	8-719-107-94	DIODE	1SS202-1				Q201	8-729-217-03	TRANSISTOR	2SK170-BL		
D521	8-719-107-94	DIODE	1SS202-1				Q202	8-729-217-03	TRANSISTOR	2SK170-BL		
D524	8-719-107-94	DIODE	1SS202-1				Q203	8-729-375-61	TRANSISTOR	2SD666-C		
D601	8-719-107-94	DIODE	1SS202-1				Q204	8-729-201-56	TRANSISTOR	2SK246-GR2		
D602	8-719-107-94	DIODE	1SS202-1				Q205	8-729-194-57	TRANSISTOR	2SC945-P		
D603	8-719-107-94	DIODE	1SS202-1				Q206	8-729-141-30	TRANSISTOR	2SC3623A-LK		
D604	8-719-107-94	DIODE	1SS202-1				Q501	8-729-900-61	TRANSISTOR	DTA114ES		
D602	8-719-107-94	DIODE	1SS202-1				Q502	8-729-900-89	TRANSISTOR	DTC144ES		
D603	8-719-107-94	DIODE	1SS202-1				Q503	8-729-900-74	TRANSISTOR	DTC143TS		

**PB COUNTER AC SW TIMER SW REC VOL REC EQ SW**

**H.P. AMP PIN JACK MONITOR SW**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Q504	8-729-620-05	TRANSISTOR	2SC2603-EF	R131	1-247-710-11	CARBON	560 5% 1/4W
Q505	8-729-900-74	TRANSISTOR	DTC143TS	R132	1-246-545-00	CARBON	1.0M 5% 1/4W
Q506	8-729-900-89	TRANSISTOR	DTC144ES	R133	1-249-462-11	CARBON	22K 5% 1/4W
Q507	8-729-119-76	TRANSISTOR	2SA1175-HFE	R134	1-247-152-00	CARBON	7.5K 5% 1/4W
Q508	8-729-900-89	TRANSISTOR	DTC144ES	R135	1-247-711-11	CARBON	680 5% 1/4W
Q509	8-729-107-53	TRANSISTOR	2SC2275A	R136	1-247-154-00	CARBON	9.1K 5% 1/4W
Q510	8-729-375-61	TRANSISTOR	2SD666A	R137	1-249-465-11	CARBON	47K 5% 1/4W
Q511	8-729-375-61	TRANSISTOR	2SD666A	R155	1-247-721-11	CARBON	4.7K 5% 1/4W
Q512	8-729-201-56	TRANSISTOR	2SK246-GR2	R156	1-247-152-00	CARBON	8.2K 5% 1/4W
Q513	8-729-190-53	TRANSISTOR	2SA985A	R157	1-247-725-11	CARBON	10K 5% 1/4W
Q514	8-729-371-61	TRANSISTOR	2SB716	R158	1-247-721-11	CARBON	4.7K 5% 1/4W
Q515	8-729-371-61	TRANSISTOR	2SB716	R159	1-259-500-11	CARBON	1M 5% 1/6W
Q516	8-729-201-56	TRANSISTOR	2SK246-GR2	R160	1-249-462-11	CARBON	22K 5% 1/4W
Q537	8-729-371-61	TRANSISTOR	2SB716	R181	1-247-725-11	CARBON	10K 5% 1/4W
Q538	8-729-375-61	TRANSISTOR	2SD666A	R182	1-249-461-11	CARBON	18K 5% 1/4W
Q601	8-729-900-61	TRANSISTOR	DTA114ES	R183	1-249-469-11	CARBON	100K 5% 1/4W
Q602	8-729-900-61	TRANSISTOR	DTA114ES	R184	1-247-704-11	CARBON	220 5% 1/4W
Q603	8-729-900-65	TRANSISTOR	DTA144ES	R190	1-247-749-11	CARBON	560 5% 1/2W
Q604	8-729-900-65	TRANSISTOR	DTA144ES	R191	1-246-545-00	CARBON	1.0M 5% 1/4W
Q605	8-729-900-65	TRANSISTOR	DTA144ES	R192	1-246-545-00	CARBON	1.0M 5% 1/4W
Q606	8-729-900-65	TRANSISTOR	DTA144ES	R193	1-249-490-11	CARBON	27K 5% 1/2W
Q607	8-729-900-65	TRANSISTOR	DTA144ES	R196	1-215-472-00	METAL	130K 1% 1/6W
Q608	8-729-900-65	TRANSISTOR	DTA144ES	R201	1-249-844-11	CARBON	56K 5% 1/2W
Q609	8-729-900-89	TRANSISTOR	DTC144ES	R202	1-247-128-00	CARBON	750 5% 1/4W
Q610	8-729-900-65	TRANSISTOR	DTA144ES	R203	1-247-128-00	CARBON	750 5% 1/4W
Q611	8-729-900-65	TRANSISTOR	DTA144ES	R204	1-249-504-11	CARBON	10 5% 1/4W
		< RESISTOR >		R205	1-247-708-11	CARBON	470 5% 1/4W
				R206	1-249-518-11	CARBON	39 5% 1/4W
				R207	1-247-721-11	CARBON	4.7K 5% 1/4W
R101	1-249-844-11	CARBON	56K 5% 1/2W	R208	1-247-704-11	CARBON	220 5% 1/4W
R102	1-247-128-00	CARBON	750 5% 1/4W	R209	1-249-723-11	CARBON	120K 5% 1/2W
R103	1-247-128-00	CARBON	750 5% 1/4W	R210	1-247-255-00	CARBON	4.3K 5% 1/2W
R104	1-249-504-11	CARBON	10 5% 1/4W	R211	1-249-462-11	CARBON	22K 5% 1/4W
R105	1-247-708-11	CARBON	470 5% 1/4W	R212	1-247-740-11	CARBON	120 5% 1/2W
R106	1-249-518-11	CARBON	39 5% 1/4W	R213	1-249-658-11	CARBON	240 5% 1/2W
R107	1-247-721-11	CARBON	4.7K 5% 1/4W	R214	1-214-851-00	METAL	300 1% 1/2W
R108	1-247-704-11	CARBON	220 5% 1/4W	R215	1-247-764-11	CARBON	10K 5% 1/2W
R109	1-249-723-11	CARBON	120K 5% 1/2W	R216	1-249-429-11	CARBON	10K 5% 1/4W
R110	1-247-255-00	CARBON	4.3K 5% 1/2W	R217	1-247-720-11	CARBON	3.9K 5% 1/4W
R111	1-249-462-11	CARBON	22K 5% 1/4W	R218	1-247-718-11	CARBON	2.7K 5% 1/4W
R112	1-247-740-11	CARBON	120 5% 1/2W	R219	1-247-718-11	CARBON	2.7K 5% 1/4W
R113	1-249-658-11	CARBON	240 5% 1/2W	R220	1-247-721-11	CARBON	4.7K 5% 1/4W
R114	1-214-851-00	METAL	300 1% 1/2W	R221	1-247-146-00	CARBON	4.3K 5% 1/4W
R115	1-247-764-11	CARBON	10K 5% 1/2W	R222	1-247-718-11	CARBON	2.7K 5% 1/4W
R116	1-249-429-11	CARBON	10K 5% 1/4W	R223	1-247-718-11	CARBON	2.7K 5% 1/4W
R117	1-247-720-11	CARBON	3.9K 5% 1/4W	R224	1-247-719-11	CARBON	3.3K 5% 1/4W
R118	1-247-718-11	CARBON	2.7K 5% 1/4W	R225	1-249-926-11	CARBON	1.3K 5% 1/4W
R119	1-247-718-11	CARBON	2.7K 5% 1/4W	R226	1-247-891-00	CARBON	330K 5% 1/4W
R120	1-247-721-11	CARBON	4.7K 5% 1/4W	R227	1-247-749-11	CARBON	560 5% 1/2W
R121	1-247-146-00	CARBON	4.3K 5% 1/4W	R228	1-247-764-11	CARBON	10K 5% 1/2W
R122	1-247-718-11	CARBON	2.7K 5% 1/4W	R229	1-247-146-00	CARBON	4.3K 5% 1/4W
R123	1-247-718-11	CARBON	2.7K 5% 1/4W	R230	1-247-142-00	CARBON	3K 5% 1/4W
R124	1-247-719-11	CARBON	3.3K 5% 1/4W	R231	1-247-710-11	CARBON	560 5% 1/4W
R125	1-249-926-11	CARBON	1.3K 5% 1/4W	R232	1-246-545-00	CARBON	1.0M 5% 1/4W
R126	1-247-891-00	CARBON	330K 5% 1/4W	R233	1-249-462-11	CARBON	22K 5% 1/4W
R127	1-247-749-11	CARBON	560 5% 1/2W	R234	1-247-152-00	CARBON	7.5K 5% 1/4W
R128	1-247-764-11	CARBON	10K 5% 1/2W	R235	1-247-711-11	CARBON	680 5% 1/4W
R129	1-247-146-00	CARBON	4.3K 5% 1/4W	R236	1-247-154-00	CARBON	9.1K 5% 1/4W
R130	1-247-142-00	CARBON	3K 5% 1/4W	R237	1-249-465-11	CARBON	47K 5% 1/4W
				R255	1-247-721-11	CARBON	4.7K 5% 1/4W

**PB COUNTER AC SW TIMER SW REC VOL REC EQ SW**

**H.P. AMP PIN JACK MONITOR SW**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R256	1-247-152-00	CARBON	8.2K 5% 1/4W	R604	1-247-903-00	CARBON	1M 5% 1/4W
R257	1-247-725-11	CARBON	10K 5% 1/4W	R605	1-247-895-00	CARBON	470K 5% 1/4W
R258	1-247-721-11	CARBON	4.7K 5% 1/4W	R606	1-249-433-11	CARBON	22K 5% 1/4W
R259	1-259-500-11	CARBON	1M 5% 1/6W	R607	1-249-433-11	CARBON	22K 5% 1/4W
R260	1-249-462-11	CARBON	22K 5% 1/4W	R608	1-249-437-11	CARBON	47K 5% 1/4W
R281	1-247-725-11	CARBON	10K 5% 1/4W	R609	1-249-437-11	CARBON	47K 5% 1/4W
R282	1-249-461-11	CARBON	18K 5% 1/4W	R610	1-249-437-11	CARBON	47K 5% 1/4W
R283	1-249-469-11	CARBON	100K 5% 1/4W	R611	1-249-437-11	CARBON	47K 5% 1/4W
R284	1-247-704-11	CARBON	220 5% 1/4W	R612	1-249-437-11	CARBON	47K 5% 1/4W
R290	1-247-749-11	CARBON	560 5% 1/2W	R613	1-249-437-11	CARBON	47K 5% 1/4W
R291	1-246-545-00	CARBON	1.0M 5% 1/4W	R614	1-249-421-11	CARBON	2.2K 5% 1/4W
R292	1-246-545-00	CARBON	1.0M 5% 1/4W	R615	1-249-421-11	CARBON	2.2K 5% 1/4W
R293	1-249-490-11	CARBON	27K 5% 1/2W	R616	1-249-429-11	CARBON	10K 5% 1/4W
R321	1-249-824-11	CARBON	8.2K 5% 1/2W	R617	1-249-437-11	CARBON	47K 5% 1/4W
R322	1-259-500-11	CARBON	1M 5% 1/6W	R618	1-247-842-11	CARBON	3K 5% 1/4W
R323	1-259-436-11	CARBON	2.2K 5% 1/6W	R619	1-249-426-11	CARBON	5.6K 5% 1/4W
R421	1-249-824-11	CARBON	8.2K 5% 1/2W	R620	1-249-437-11	CARBON	47K 5% 1/4W
R422	1-259-500-11	CARBON	1M 5% 1/6W	R621	1-249-421-11	CARBON	2.2K 5% 1/4W
R423	1-259-436-11	CARBON	2.2K 5% 1/6W	R622	1-249-421-11	CARBON	2.2K 5% 1/4W
R501	1-249-434-11	CARBON	27K 5% 1/4W	R699	1-247-764-11	CARBON	10K 5% 1/2W
R502	1-249-429-11	CARBON	10K 5% 1/4W	R881	1-247-903-00	CARBON	1M 5% 1/4W
R503	1-249-425-11	CARBON	4.7K 5% 1/4W	R882	1-249-433-11	CARBON	22K 5% 1/4W
R504	1-249-433-11	CARBON	22K 5% 1/4W	R883	1-249-425-11	CARBON	4.7K 5% 1/4W
R506	1-249-429-11	CARBON	10K 5% 1/4W	R884	1-249-425-11	CARBON	4.7K 5% 1/4W
R507	1-249-417-11	CARBON	1K 5% 1/4W	R885	1-249-422-11	CARBON	2.7K 5% 1/4W
R508	1-249-435-11	CARBON	33K 5% 1/4W	R886	1-249-424-11	CARBON	3.9K 5% 1/4W
R509	1-249-429-11	CARBON	10K 5% 1/4W	R887	1-249-422-11	CARBON	2.7K 5% 1/4W
R510	1-249-425-11	CARBON	4.7K 5% 1/4W	R888	1-249-424-11	CARBON	3.9K 5% 1/4W
R511	1-249-417-11	CARBON	1K 5% 1/4W	R889	1-249-428-11	CARBON	8.2K 5% 1/4W
R512	1-249-434-11	CARBON	27K 5% 1/4W	R890	1-249-434-11	CARBON	27K 5% 1/4W
R513	1-249-429-11	CARBON	10K 5% 1/4W	R891	1-249-422-11	CARBON	2.7K 5% 1/4W
R514	1-249-441-11	CARBON	100K 5% 1/4W	R892	1-249-424-11	CARBON	3.9K 5% 1/4W
R515	1-249-417-11	CARBON	1K 5% 1/4W	R893	1-249-428-11	CARBON	8.2K 5% 1/4W
R516	1-249-433-11	CARBON	22K 5% 1/4W	R894	1-249-434-11	CARBON	27K 5% 1/4W
R517	1-249-431-11	CARBON	15K 5% 1/4W	R895	1-249-424-11	CARBON	3.9K 5% 1/4W
R518	1-249-429-11	CARBON	10K 5% 1/4W			< VARIABLE RESISTOR >	
R519	1-249-433-11	CARBON	22K 5% 1/4W				
R521	1-247-749-11	CARBON	560 5% 1/2W	RV101	1-224-550-21	RES, ADJ, METAL GLAZE	220
R522	1-249-673-11	CARBON	1K 5% 1/2W	RV201	1-224-550-21	RES, ADJ, METAL GLAZE	220
R523	1-247-719-11	CARBON	3.3K 5% 1/4W	RV501	1-230-344-11	RES, VAR, CARBON	20K/20K
R524	1-249-547-11	CARBON	620 5% 1/4W	RV502	1-238-840-11	RES, VAR, CARBON	5K/5K
R525	1-249-466-11	CARBON	56K 5% 1/4W	RV503	1-241-336-11	RES, VAR, CARBON	20K/20K
R526	1-249-673-11	CARBON	1K 5% 1/2W	RV601	1-241-335-11	RES, VAR, CARBON	5K
R527	1-247-749-11	CARBON	560 5% 1/2W			< RELAY >	
R528	1-247-719-11	CARBON	3.3K 5% 1/4W				
R529	1-249-547-11	CARBON	620 5% 1/4W	RY503	1-515-803-11	RELAY	
R530	1-249-466-11	CARBON	56K 5% 1/4W			< SWITCH >	
R570	1-249-433-11	CARBON	22K 5% 1/4W	S501	1-572-589-11	SWITCH, ROTARY (REC EQ CAL)	
R571	1-249-429-11	CARBON	10K 5% 1/4W	S601	1-572-339-11	SWITCH, PUSH (1 KEY) (HX PRO)	
R574	1-249-429-11	CARBON	10K 5% 1/4W	S602	1-572-339-11	SWITCH, PUSH (1 KEY) (CAL IBRATION)	
R577	1-247-714-11	CARBON	1.2K 5% 1/4W	S603	1-554-833-11	SWITCH, PUSH (1 KEY) (INPUT:CD/LINE)	
R578	1-247-704-11	CARBON	220 5% 1/4W	S604	1-572-588-11	SWITCH, ROTARY (DOLBY NR)	
R579	1-247-714-11	CARBON	1.2K 5% 1/4W	S605	1-572-590-11	SWITCH, ROTARY (MONITOR)	
R580	1-247-704-11	CARBON	220 5% 1/4W	S701	△1-572-267-21	SWITCH, PUSH (AC POWER) (1 KEY) (POWER)	
R581	1-247-700-11	CARBON	100 5% 1/4W	S881	1-554-303-21	SWITCH, TACTILE (RESET)	
R582	1-247-700-11	CARBON	100 5% 1/4W	S882	1-554-303-21	SWITCH, TACTILE (MEMORY)	
R599	1-247-764-11	CARBON	10K 5% 1/2W	S883	1-554-303-21	SWITCH, TACTILE (DISPLAY MODE)	
R601	1-249-441-11	CARBON	100K 5% 1/4W				
R602	1-249-441-11	CARBON	100K 5% 1/4W				
R603	1-249-425-11	CARBON	4.7K 5% 1/4W				

Note: The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

PB	COUNTER	AC SW	TIMER SW	REC VOL	REC EQ SW		
	H.P. AMP	PIN JACK	MONITOR SW	RECT.			
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
S884	1-554-303-21	SWITCH, TACTILE (▲)		C155	1-130-485-00	MYLAR	0.015uF 5% 50V
S885	1-554-303-21	SWITCH, TACTILE (■)		C156	1-136-160-00	FILM	0.039uF 5% 50V
S886	1-554-303-21	SWITCH, TACTILE (◀)		C157	1-130-486-00	MYLAR	0.018uF 10% 50V
S887	1-554-303-21	SWITCH, TACTILE (▶)		C159	1-124-929-11	ELECT	22uF 20% 100V
S888	1-554-303-21	SWITCH, TACTILE (●)		C160	1-136-252-00	FILM	0.0015uF 5% 100V
S889	1-554-303-21	SWITCH, TACTILE (▶)		C161	1-107-157-00	MICA	27PF 5% 500V
S890	1-554-303-21	SWITCH, TACTILE (■)		C162	1-107-159-00	MICA	33PF 5% 500V
S891	1-554-303-21	SWITCH, TACTILE (◀)		C163	1-107-169-00	MICA	100PF 5% 500V
S892	1-554-303-21	SWITCH, TACTILE (▶)		C164	1-109-627-00	MICA	150PF 2% 500V
S893	1-554-303-21	SWITCH, TACTILE (○)		C165	1-109-621-00	MICA	220PF 1% 500V
S894	1-570-903-11	SWITCH, SLIDE (TIMER) ( VIBRATOR )		C166	1-136-153-00	FILM	0.01uF 5% 50V
X601	1-577-358-21	VIBRATOR, CERAMIC		C167	1-136-163-00	FILM	0.068uF 5% 50V
X881	1-577-358-21	VIBRATOR, CERAMIC		C168	1-136-157-00	FILM	0.022uF 5% 50V
				C170	1-124-925-11	ELECT	2.2uF 20% 100V
				C171	1-123-382-00	ELECT	3.3uF 20% 100V
				C173	1-124-925-11	ELECT	2.2uF 20% 100V
				C174	1-136-165-00	FILM	0.1uF 5% 50V
				C228	1-123-369-00	ELECT	4.7uF 20% 63V
				C229	1-123-369-00	ELECT	4.7uF 20% 63V
				C230	1-124-767-00	ELECT	2.2uF 20% 50V
* 1-637-512-11	RECT. BOARD *****			C231	1-107-159-00	MICA	33PF 5% 500V
* 1-533-213-31	HOLDER, FUSE			C232	1-107-159-00	MICA	33PF 5% 500V
* 3-346-266-12	PLATE, GROUND			C233	1-130-475-00	MYLAR	0.0022uF 5% 50V
* 3-356-925-01	HEAT SINK			C234	1-130-475-00	MYLAR	0.0022uF 5% 50V
* 4-363-146-21	HEAT SINK, V. OUT			C235	1-130-478-00	MYLAR	0.0039uF 5% 50V
7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3			C236	1-136-173-00	FILM	0.47uF 5% 50V
7-682-547-04	SCREW +BVTT 3X6 (S) ( CAPACITOR )			C237	1-136-167-00	FILM	0.15uF 5% 50V
				C238	1-136-155-00	FILM	0.015uF 5% 50V
				C239	1-123-380-00	ELECT	1uF 20% 50V
				C240	1-136-169-00	FILM	0.22uF 5% 50V
C128	1-123-369-00	ELECT	4.7uF 20% 63V	C241	1-136-163-00	FILM	0.068uF 5% 50V
C129	1-123-369-00	ELECT	4.7uF 20% 63V	C242	1-136-162-00	FILM	0.056uF 5% 50V
C130	1-124-767-00	ELECT	2.2uF 20% 50V	C243	1-123-380-00	ELECT	1uF 20% 50V
C131	1-107-159-00	MICA	33PF 5% 500V	C244	1-130-480-00	MYLAR	0.0056uF 5% 50V
C132	1-107-159-00	MICA	33PF 5% 500V	C245	1-136-153-00	FILM	0.01uF 5% 50V
C133	1-130-475-00	MYLAR	0.0022uF 5% 50V	C246	1-124-929-11	ELECT	22uF 20% 100V
C134	1-130-475-00	MYLAR	0.0022uF 5% 50V	C247	1-124-929-11	ELECT	22uF 20% 100V
C135	1-130-478-00	MYLAR	0.0039uF 5% 50V	C250	1-136-252-00	FILM	0.0015uF 5% 100V
C136	1-136-173-00	FILM	0.47uF 5% 50V	C251	1-124-915-11	ELECT	10uF 20% 63V
C137	1-136-167-00	FILM	0.15uF 5% 50V	C252	1-136-163-00	FILM	0.068uF 5% 50V
C138	1-136-155-00	FILM	0.015uF 5% 50V	C253	1-130-485-00	MYLAR	0.015uF 5% 50V
C139	1-123-380-00	ELECT	1uF 20% 50V	C254	1-136-160-00	FILM	0.039uF 5% 50V
C140	1-136-169-00	FILM	0.22uF 5% 50V	C255	1-130-485-00	MYLAR	0.015uF 5% 50V
C141	1-136-163-00	FILM	0.068uF 5% 50V	C256	1-136-160-00	FILM	0.039uF 5% 50V
C142	1-136-162-00	FILM	0.056uF 5% 50V	C257	1-130-486-00	MYLAR	0.018uF 10% 50V
C143	1-123-380-00	ELECT	1uF 20% 50V	C259	1-124-929-11	ELECT	22uF 20% 100V
C144	1-130-480-00	MYLAR	0.0056uF 5% 50V	C260	1-136-252-00	FILM	0.0015uF 5% 100V
C145	1-136-153-00	FILM	0.01uF 5% 50V	C261	1-107-157-00	MICA	27PF 5% 500V
C146	1-124-929-11	ELECT	22uF 20% 100V	C262	1-107-159-00	MICA	33PF 5% 500V
C147	1-124-929-11	ELECT	22uF 20% 100V	C263	1-107-169-00	MICA	100PF 5% 500V
C150	1-136-252-00	FILM	0.0015uF 5% 100V	C264	1-109-627-00	MICA	150PF 2% 500V
C151	1-124-915-11	ELECT	10uF 20% 63V	C265	1-109-621-00	MICA	220PF 1% 500V
C152	1-136-163-00	FILM	0.068uF 5% 50V	C266	1-136-153-00	FILM	0.01uF 5% 50V
C153	1-130-485-00	MYLAR	0.015uF 5% 50V	C267	1-136-163-00	FILM	0.068uF 5% 50V
C154	1-136-160-00	FILM	0.039uF 5% 50V	C268	1-136-157-00	FILM	0.022uF 5% 50V
				C270	1-124-925-11	ELECT	2.2uF 20% 100V
				C271	1-123-382-00	ELECT	3.3uF 20% 100V
				C272	1-161-375-00	CERAMIC	0.0022uF 20% 50V
				C273	1-124-925-11	ELECT	2.2uF 20% 100V
				C515	1-124-907-11	ELECT	10uF 20% 50V

## RECT.

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark					
C516	1-123-369-00	ELECT	4.7uF	20%	63V	C806	1-162-294-31	CERAMIC	0.001uF	10%	50V			
C517	1-123-369-00	ELECT	4.7uF	20%	63V	C807	1-162-294-31	CERAMIC	0.001uF	10%	50V			
C520	1-123-369-00	ELECT	4.7uF	20%	63V	< CONNECTOR >								
C521	1-124-477-11	ELECT	47uF	20%	25V	CN703	* 1-564-104-00	PIN, CONNECTOR 3P						
C522	1-123-369-00	ELECT	4.7uF	20%	63V	CN704	* 1-564-506-11	PLUG, CONNECTOR 3P						
C523	1-124-477-11	ELECT	47uF	20%	25V	CN705	* 1-564-506-11	PLUG, CONNECTOR 3P						
C524	1-124-903-11	ELECT	1uF	20%	50V	CN751	* 1-564-511-11	PLUG, CONNECTOR 8P						
C525	1-124-907-11	ELECT	10uF	20%	50V	CN801	* 1-564-336-00	PIN, CONNECTOR 2P						
C528	1-107-026-00	MICA	5.1PF	500V			CN802	* 1-564-341-11	PIN, CONNECTOR 7P					
C529	1-124-477-11	ELECT	47uF	20%	25V	CN803	* 1-506-503-71	PIN, CONNECTOR 9P						
C530	1-124-925-11	ELECT	2.2uF	20%	100V	CN804	* 1-506-503-11	PIN, CONNECTOR 9P						
C531	1-124-915-11	ELECT	10uF	20%	63V	CN805	* 1-564-339-00	PIN, CONNECTOR 5P						
C532	1-124-477-11	ELECT	47uF	20%	25V	CN806	* 1-564-666-11	PIN, CONNECTOR 10P						
C533	1-124-915-11	ELECT	10uF	20%	63V	CN807	* 1-564-342-61	PIN, CONNECTOR 8P						
C534	1-124-477-11	ELECT	47uF	20%	25V	CN809	* 1-506-503-11	PIN, CONNECTOR 9P						
C535	1-124-477-11	ELECT	47uF	20%	25V	CND501	* 1-564-340-00	PIN, CONNECTOR 6P						
C536	1-124-477-11	ELECT	47uF	20%	25V	CND502	* 1-564-341-11	PIN, CONNECTOR 7P						
C537	1-130-474-00	MYLAR	0.0018uF	5%	50V	CNE101	* 1-564-507-11	PLUG, CONNECTOR 4P						
C538	1-130-474-00	MYLAR	0.0018uF	5%	50V	CNE201	* 1-564-507-11	PLUG, CONNECTOR 4P						
C539	1-136-157-00	FILM	0.022uF	5%	50V	CNE504	* 1-564-506-11	PLUG, CONNECTOR 3P						
C540	1-136-157-00	FILM	0.022uF	5%	50V	CNN505	* 1-560-062-00	PIN, CONNECTOR 4P						
C541	1-124-907-11	ELECT	10uF	20%	50V	CNN506	* 1-560-061-00	PIN, CONNECTOR 3P						
C542	1-126-233-11	ELECT	22uF	20%	50V	< OSCILLATION UNIT >								
C543	1-162-217-31	CERAMIC	56PF	5%	50V	CP501	1-466-252-11	OSCILLATION UNIT, BIAS						
C544	1-162-217-31	CERAMIC	56PF	5%	50V	< DIODE >								
C545	1-124-477-11	ELECT	47uF	20%	25V	D101	8-719-000-60	DIODE UZL-6M2						
C546	1-164-159-11	CERAMIC	0.1uF	50V			D102	8-719-107-94	DIODE ISS202-1					
C702	1-136-165-00	FILM	0.1uF	5%	50V	D103	8-719-107-94	DIODE ISS202-1						
C703	1-136-177-00	FILM	1uF	5%	50V	D201	8-719-000-60	DIODE UZL-6M2						
C704	1-126-982-11	ELECT	5600uF	20%	0	D202	8-719-107-94	DIODE ISS202-1						
C705	1-126-982-11	ELECT	5600uF	20%	0	D203	8-719-107-94	DIODE ISS202-1						
C706	1-124-636-00	ELECT	3300uF	20%	25V	D511	8-719-114-29	DIODE RD5.1JS-B1						
C707	1-124-120-11	ELECT	220uF	20%	25V	D512	8-719-107-94	DIODE ISS202-1						
C708	1-124-479-11	ELECT	330uF	20%	25V	D514	8-719-107-94	DIODE ISS202-1						
C709	1-124-911-11	ELECT	220uF	20%	50V	D515	8-719-107-94	DIODE ISS202-1						
C710	1-124-767-00	ELECT	2.2uF	20%	50V	D516	8-719-114-29	DIODE RD5.1JS-B1						
C711	1-162-294-31	CERAMIC	0.001uF	10%	50V	D517	8-719-107-94	DIODE ISS202-1						
C712	1-162-294-31	CERAMIC	0.001uF	10%	50V	D523	8-719-933-41	DIODE HZS6C3L						
C751	1-124-636-00	ELECT	3300uF	20%	25V	D525	8-719-107-94	DIODE ISS202-1						
C752	1-124-907-11	ELECT	10uF	20%	50V	D526	8-719-107-94	DIODE ISS202-1						
C753	1-124-122-11	ELECT	100uF	20%	50V	D527	8-719-114-29	DIODE RD5.1JS-B1						
C754	1-124-927-11	ELECT	4.7uF	20%	100V	D701	8-719-230-02	DIODE 30DF2						
C755	1-126-101-11	ELECT	100uF	20%	16V	D702	8-719-230-02	DIODE 30DF2						
C756	1-124-898-11	ELECT	4700uF	20%	16V	D703	8-719-230-02	DIODE 30DF2						
C757	1-124-907-11	ELECT	10uF	20%	50V	D704	8-719-230-02	DIODE 30DF2						
C758	1-162-211-31	CERAMIC	33PF	5%	50V	D705	8-719-200-77	DIODE 10E2N						
C759	1-124-472-11	ELECT	470uF	20%	10V	D706	8-719-200-77	DIODE 10E2N						
C760	1-124-903-11	ELECT	1uF	20%	50V	D707	8-719-200-77	DIODE 10E2N						
C761	1-124-471-00	ELECT	1000uF	20%	6.3V	D708	8-719-200-77	DIODE 10E2N						
C762	1-124-903-11	ELECT	1uF	20%	50V	D709	8-719-200-77	DIODE 10E2N						
C763	1-124-903-11	ELECT	1uF	20%	50V	D710	8-719-200-77	DIODE 10E2N						
C764	1-124-443-00	ELECT	100uF	20%	10V	D707	8-719-200-77	DIODE 10E2N						
C765	1-124-907-11	ELECT	10uF	20%	50V	D708	8-719-200-77	DIODE 10E2N						
C766	1-124-122-11	ELECT	100uF	20%	50V	D709	8-719-200-77	DIODE 10E2N						
C767	1-124-443-00	ELECT	100uF	20%	10V	D710	8-719-200-77	DIODE 10E2N						
C801	1-164-159-11	CERAMIC	0.1uF	50V			D711	8-719-107-94	DIODE ISS202-1					
C802	1-164-159-11	CERAMIC	0.1uF	50V			D712	8-719-107-94	DIODE ISS202-1					
C803	1-124-477-11	ELECT	47uF	20%	25V	D751	8-719-200-77	DIODE 10E2N						
C804	1-124-907-11	ELECT	10uF	20%	50V									
C805	1-124-443-00	ELECT	100uF	20%	10V									

RECT.

Ref. No.	Part No.	Description		Remark	Ref. No.	Part No.	Description		Remark
D752	8-719-910-25	DIODE	HZS12B2L		Q110	8-729-141-30	TRANSISTOR	2SC3623A-LK	
D753	8-719-933-39	DIODE	HZS6C1L		Q111	8-729-141-30	TRANSISTOR	2SC3623A-LK	
D754	8-719-933-41	DIODE	HZS6C3L		Q112	8-729-900-80	TRANSISTOR	DTC114ES	
D755	8-719-933-39	DIODE	HZS6C1L		Q113	8-729-900-80	TRANSISTOR	DTC114ES	
D756	8-719-002-33	DIODE	UZL-24L		Q114	8-729-900-80	TRANSISTOR	DTC114ES	
D757	8-719-200-77	DIODE	10E2N		Q116	8-729-141-30	TRANSISTOR	2SC3623A-LK	
D758	8-719-933-39	DIODE	HZS6C1L		Q117	8-729-141-30	TRANSISTOR	2SC3623A-LK	
D801	8-719-107-94	DIODE	1SS202-1		Q118	8-729-141-30	TRANSISTOR	2SC3623A-LK	
D802	8-719-107-94	DIODE	1SS202-1		Q207	8-729-142-25	TRANSISTOR	2SD1020-HFE	
		< IC >			Q208	8-729-141-30	TRANSISTOR	2SC3623A-LK	
IC504	8-759-602-83	IC	M5238P		Q209	8-729-141-30	TRANSISTOR	2SC3623A-LK	
IC505	8-752-018-80	IC	CX20188		Q210	8-729-141-30	TRANSISTOR	2SC3623A-LK	
IC506	8-759-900-72	IC	NE5532P		Q211	8-729-141-30	TRANSISTOR	2SC3623A-LK	
IC508	8-759-106-56	IC	uPC1297CA		Q212	8-729-900-80	TRANSISTOR	DTC114ES	
IC509	8-759-604-86	IC	M5F7807		Q213	8-729-900-80	TRANSISTOR	DTC114ES	
IC510	8-759-604-90	IC	M5F7907		Q214	8-729-900-80	TRANSISTOR	DTC114ES	
IC511	8-759-240-50	IC	TC4050BP		Q216	8-729-141-30	TRANSISTOR	2SC3623A-LK	
IC512	8-759-602-83	IC	M5238P		Q217	8-729-141-30	TRANSISTOR	2SC3623A-LK	
IC513	8-759-945-58	IC	RC4558P		Q218	8-729-141-30	TRANSISTOR	2SC3623A-LK	
IC514	8-759-634-51	IC	M5218AP		Q517	8-729-900-61	TRANSISTOR	DTA114ES	
IC515	8-759-945-58	IC	RC4558P		Q518	8-729-281-53	TRANSISTOR	2SC1815-GR	
IC518	8-759-982-26	IC	RC78L12A		Q519	8-729-119-76	TRANSISTOR	2SA1175-HFE	
IC519	8-759-982-48	IC	RC79L12A		Q520	8-729-900-36	TRANSISTOR	DTC124ES	
IC801	8-759-635-69	IC	M50964-226SP		Q522	8-729-141-30	TRANSISTOR	2SC3623ATP-LK	
IC802	8-759-973-95	IC	BA6219B		Q523	8-729-141-30	TRANSISTOR	2SC3623ATP-LK	
IC803	8-759-822-09	IC	LB1641		Q524	8-729-141-30	TRANSISTOR	2SC3623ATP-LK	
		< COIL >			Q529	8-729-141-30	TRANSISTOR	2SC3623ATP-LK	
L101	1-408-920-00	INDUCTOR	4.7mH		Q530	8-729-141-30	TRANSISTOR	2SC3623ATP-LK	
L102	1-408-918-11	INDUCTOR	3.3mH		Q533	8-729-900-36	TRANSISTOR	DTC124ES	
L103	1-408-916-11	INDUCTOR	2.2mH		Q534	8-729-900-74	TRANSISTOR	DTC143TS	
L104	1-408-925-11	INDUCTOR	12mH		Q535	8-729-900-36	TRANSISTOR	DTC124ES	
L105	1-408-916-11	INDUCTOR	2.2mH		Q536	8-729-900-36	TRANSISTOR	DTC124ES	
L201	1-408-920-00	INDUCTOR	4.7mH		Q539	8-729-900-36	TRANSISTOR	DTC124ES	
L202	1-408-918-11	INDUCTOR	3.3mH		Q540	8-729-620-05	TRANSISTOR	2SC2603-EF	
L203	1-408-916-11	INDUCTOR	2.2mH		Q701	8-729-620-05	TRANSISTOR	2SC2603-EF	
L204	1-408-925-11	INDUCTOR	12mH		Q751	8-729-924-90	TRANSISTOR	2SB1370-EF	
L205	1-408-916-11	INDUCTOR	2.2mH		Q752	8-729-924-90	TRANSISTOR	2SB1370-EF	
L501	1-410-525-11	INDUCTOR	220uH		Q753	8-729-111-55	TRANSISTOR	2SD2061-EF	
L502	1-410-525-11	INDUCTOR	220uH		Q754	8-729-119-76	TRANSISTOR	2SA1175-HFE	
L503	1-410-525-11	INDUCTOR	220uH		Q755	8-729-140-97	TRANSISTOR	2SB734-34	
		< PILOT LAMP >			Q756	8-729-620-05	TRANSISTOR	2SC2603-EF	
LP501	1-518-471-31	LAMP, PILOT			Q757	8-729-620-05	TRANSISTOR	2SC2603-EF	
LP502	1-518-471-31	LAMP, PILOT			Q758	8-729-620-05	TRANSISTOR	2SC2603-EF	
		< FILTER >			Q759	8-729-620-05	TRANSISTOR	2SC2603-EF	
LPF101	1-236-087-11	FILTER, LOW PASS			Q801	8-729-119-76	TRANSISTOR	2SA1175-HFE	
LPF201	1-236-087-11	FILTER, LOW PASS			Q802	8-729-119-76	TRANSISTOR	2SA1175-HFE	
		< IC LINK >			Q803	8-729-620-05	TRANSISTOR	2SC2603-EF	
PS701	1-532-685-00	LINK, IC			Q804	8-729-620-05	TRANSISTOR	2SC2603-EF	
PS702	1-532-685-00	LINK, IC			Q805	8-729-900-61	TRANSISTOR	DTA114ES	
		< TRANSISTOR >			Q806	8-729-900-61	TRANSISTOR	DTA114ES	
Q107	8-729-142-25	TRANSISTOR	2SD1020TP-HFE		Q807	8-729-900-61	TRANSISTOR	DTA114ES	
Q108	8-729-141-30	TRANSISTOR	2SC3623A-LK		Q808	8-729-900-61	TRANSISTOR	DTA114ES	
Q109	8-729-141-30	TRANSISTOR	2SC3623A-LK		Q809	8-729-900-65	TRANSISTOR	DTA144ES	
		< TRANSISTOR >			Q810	8-729-900-65	TRANSISTOR	DTA144ES	
		< TRANSISTOR >			Q811	8-729-900-65	TRANSISTOR	DTA144ES	
		< TRANSISTOR >			Q812	8-729-900-65	TRANSISTOR	DTA144ES	
		< TRANSISTOR >			Q813	8-729-900-65	TRANSISTOR	DTA144ES	
		< TRANSISTOR >			Q814	8-729-900-65	TRANSISTOR	DTA144ES	
		< TRANSISTOR >			Q815	8-729-900-61	TRANSISTOR	DTA114ES	
		< TRANSISTOR >			Q816	8-729-900-61	TRANSISTOR	DTA114ES	

## RECT.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< RESISTOR >							
R138	1-249-469-11	CARBON	100K 5% 1/4W	R249	1-246-545-00	CARBON	1.0M 5% 1/4W
R139	1-247-723-11	CARBON	6.8K 5% 1/4W	R250	1-249-462-11	CARBON	22K 5% 1/4W
R140	1-247-720-11	CARBON	3.9K 5% 1/4W	R251	1-247-152-00	CARBON	7.5K 5% 1/4W
R141	1-247-719-11	CARBON	3.3K 5% 1/4W	R252	1-247-711-11	CARBON	680 5% 1/4W
R142	1-247-152-00	CARBON	7.5K 5% 1/4W	R253	1-247-154-00	CARBON	9.1K 5% 1/4W
R143	1-249-469-11	CARBON	100K 5% 1/4W	R254	1-249-465-11	CARBON	47K 5% 1/4W
R144	1-247-747-11	CARBON	470 5% 1/2W	R261	1-247-719-11	CARBON	3.3K 5% 1/4W
R145	1-247-764-11	CARBON	10K 5% 1/2W	R262	1-247-723-11	CARBON	6.8K 5% 1/4W
R146	1-247-146-00	CARBON	4.3K 5% 1/4W	R263	1-249-590-11	CARBON	39K 5% 1/4W
R147	1-247-142-00	CARBON	3K 5% 1/4W	R264	1-249-425-11	CARBON	4.7K 5% 1/4W
R148	1-247-710-11	CARBON	560 5% 1/4W	R265	1-249-429-11	CARBON	10K 5% 1/4W
R149	1-246-545-00	CARBON	1.0M 5% 1/4W	R266	1-249-465-11	CARBON	47K 5% 1/4W
R150	1-249-462-11	CARBON	22K 5% 1/4W	R267	1-247-716-11	CARBON	1.8K 5% 1/4W
R151	1-247-152-00	CARBON	7.5K 5% 1/4W	R268	1-249-598-11	CARBON	82K 5% 1/4W
R152	1-247-711-11	CARBON	680 5% 1/4W	R269	1-259-467-11	CARBON	43K 5% 1/4W
R153	1-247-154-00	CARBON	9.1K 5% 1/4W	R270	1-247-702-11	CARBON	150 5% 1/4W
R154	1-249-465-11	CARBON	47K 5% 1/4W	R271	1-247-154-00	CARBON	9.1K 5% 1/4W
R161	1-247-719-11	CARBON	3.3K 5% 1/4W	R272	1-249-429-11	CARBON	10K 5% 1/4W
R162	1-247-723-11	CARBON	6.8K 5% 1/4W	R273	1-247-701-11	CARBON	120 5% 1/4W
R163	1-249-590-11	CARBON	39K 5% 1/4W	R274	1-247-142-00	CARBON	3K 5% 1/4W
R164	1-249-425-11	CARBON	4.7K 5% 1/4W	R275	1-247-721-11	CARBON	4.7K 5% 1/4W
R165	1-249-429-11	CARBON	10K 5% 1/4W	R276	1-249-429-11	CARBON	10K 5% 1/4W
R166	1-249-465-11	CARBON	47K 5% 1/4W	R277	1-247-700-11	CARBON	100 5% 1/4W
R167	1-247-716-11	CARBON	1.8K 5% 1/4W	R278	1-247-719-11	CARBON	3.3K 5% 1/4W
R168	1-249-598-11	CARBON	82K 5% 1/4W	R279	1-247-719-11	CARBON	3.3K 5% 1/4W
R169	1-259-467-11	CARBON	43K 5% 1/4W	R280	1-249-429-11	CARBON	10K 5% 1/4W
R170	1-247-702-11	CARBON	150 5% 1/4W	R285	1-247-718-11	CARBON	2.7K 5% 1/4W
R171	1-247-154-00	CARBON	9.1K 5% 1/4W	R286	1-247-883-00	CARBON	150K 5% 1/4W
R172	1-249-429-11	CARBON	10K 5% 1/4W	R287	1-247-714-11	CARBON	1.2K 5% 1/4W
R173	1-247-701-11	CARBON	120 5% 1/4W	R288	1-247-714-11	CARBON	1.2K 5% 1/4W
R174	1-247-142-00	CARBON	3K 5% 1/4W	R289	1-249-425-11	CARBON	4.7K 5% 1/4W
R175	1-247-721-11	CARBON	4.7K 5% 1/4W	R294	1-247-883-00	CARBON	150K 5% 1/4W
R176	1-249-429-11	CARBON	10K 5% 1/4W	R295	1-249-417-11	CARBON	1K 5% 1/4W
R177	1-247-700-11	CARBON	100 5% 1/4W	R296	1-215-472-00	METAL	130K 1% 1/6W
R178	1-247-719-11	CARBON	3.3K 5% 1/4W	R297	1-249-408-11	CARBON	180 5% 1/4W
R179	1-247-719-11	CARBON	3.3K 5% 1/4W	R298	1-249-414-11	CARBON	560 5% 1/4W
R180	1-249-429-11	CARBON	10K 5% 1/4W	R299	1-249-417-11	CARBON	1K 5% 1/4W
R185	1-247-718-11	CARBON	2.7K 5% 1/4W	R301	1-249-428-11	CARBON	8.2K 5% 1/4W
R186	1-247-883-00	CARBON	150K 5% 1/4W	R302	1-249-417-11	CARBON	1K 5% 1/4W
R187	1-247-714-11	CARBON	1.2K 5% 1/4W	R303	1-247-725-11	CARBON	10K 5% 1/4W
R188	1-247-714-11	CARBON	1.2K 5% 1/4W	R304	1-249-429-11	CARBON	10K 5% 1/4W
R189	1-249-425-11	CARBON	4.7K 5% 1/4W	R305	1-249-429-11	CARBON	10K 5% 1/4W
R194	1-247-883-00	CARBON	150K 5% 1/4W	R306	1-249-417-11	CARBON	1K 5% 1/4W
R195	1-249-417-11	CARBON	1K 5% 1/4W	R307	1-249-437-11	CARBON	47K 5% 1/4W
R197	1-249-408-11	CARBON	180 5% 1/4W	R308	1-215-465-00	METAL	68K 1% 1/6W
R198	1-249-414-11	CARBON	560 5% 1/4W	R309	1-215-474-00	METAL	160K 1% 1/6W
R199	1-249-417-11	CARBON	1K 5% 1/4W	R310	1-215-448-00	METAL	13K 1% 1/6W
R238	1-249-469-11	CARBON	100K 5% 1/4W	R311	1-249-408-11	CARBON	180 5% 1/4W
R239	1-247-723-11	CARBON	6.8K 5% 1/4W	R312	1-247-883-00	CARBON	150K 5% 1/4W
R240	1-247-720-11	CARBON	3.9K 5% 1/4W	R314	1-249-423-11	CARBON	3.3K 5% 1/4W
R241	1-247-719-11	CARBON	3.3K 5% 1/4W	R316	1-249-425-11	CARBON	4.7K 5% 1/4W
R242	1-247-152-00	CARBON	7.5K 5% 1/4W	R317	1-249-429-11	CARBON	10K 5% 1/4W
R243	1-249-469-11	CARBON	100K 5% 1/4W	R318	1-249-616-11	CARBON	470K 5% 1/4W
R244	1-247-747-11	CARBON	470 5% 1/2W	R319	▲ 1-212-857-00	FUSIBLE	10 5% 1/4W F
R245	1-247-764-11	CARBON	10K 5% 1/2W	R320	1-249-465-11	CARBON	47K 5% 1/4W
R246	1-247-146-00	CARBON	4.3K 5% 1/4W	R401	1-249-428-11	CARBON	8.2K 5% 1/4W
R247	1-247-142-00	CARBON	3K 5% 1/4W	R402	1-249-417-11	CARBON	1K 5% 1/4W
R248	1-247-710-11	CARBON	560 5% 1/4W	R403	1-247-725-11	CARBON	10K 5% 1/4W
				R404	1-249-429-11	CARBON	10K 5% 1/4W
				R405	1-249-429-11	CARBON	10K 5% 1/4W

Note: The components identified by mark ▲ or dotted line with mark △ are critical for safety. Replace only with part number specified.

RECT.

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R406	1-249-417-11	CARBON	1K	5%	1/4W	R754	1-249-437-11	CARBON	47K	5%	1/4W
R407	1-249-437-11	CARBON	47K	5%	1/4W	R755	1-249-421-11	CARBON	2.2K	5%	1/4W
R408	1-215-465-00	METAL	68K	1%	1/6W	R756	1-249-425-11	CARBON	4.7K	5%	1/4W
R409	1-215-474-00	METAL	160K	1%	1/6W	R757	1-249-437-11	CARBON	47K	5%	1/4W
R410	1-215-448-00	METAL	13K	1%	1/6W	R758	1-249-422-11	CARBON	2.7K	5%	1/4W
R411	1-249-408-11	CARBON	180	5%	1/4W	R759	1-249-427-11	CARBON	6.8K	5%	1/4W
R412	1-247-883-00	CARBON	150K	5%	1/4W	R760	1-249-425-11	CARBON	4.7K	5%	1/4W
R414	1-249-423-11	CARBON	3.3K	5%	1/4W	R761	1-249-437-11	CARBON	47K	5%	1/4W
R416	1-249-425-11	CARBON	4.7K	5%	1/4W	R762	1-249-421-11	CARBON	2.2K	5%	1/4W
R417	1-249-429-11	CARBON	10K	5%	1/4W	R763	1-249-441-11	CARBON	100K	5%	1/4W
R418	1-249-616-11	CARBON	470K	5%	1/4W	R764	1-249-425-11	CARBON	4.7K	5%	1/4W
R419	△1-212-857-00	FUSIBLE	10	5%	1/4W F	R765	1-249-437-11	CARBON	47K	5%	1/4W
R420	1-249-465-11	CARBON	47K	5%	1/4W	R766	1-249-437-11	CARBON	47K	5%	1/4W
R531	1-249-438-11	CARBON	56K	5%	1/4W	R767	1-249-429-11	CARBON	10K	5%	1/4W
R532	1-249-433-11	CARBON	22K	5%	1/4W	R768	1-249-437-11	CARBON	47K	5%	1/4W
R533	1-249-421-11	CARBON	2.2K	5%	1/4W	R769	1-249-437-11	CARBON	47K	5%	1/4W
R537	1-249-417-11	CARBON	1K	5%	1/4W	R770	1-249-433-11	CARBON	22K	5%	1/4W
R538	1-249-425-11	CARBON	4.7K	5%	1/4W	R771	1-249-395-11	CARBON	15	5%	1/4W
R539	1-249-437-11	CARBON	47K	5%	1/4W	R772	1-249-395-11	CARBON	15	5%	1/4W
R540	1-249-433-11	CARBON	22K	5%	1/4W	R773	△1-219-136-11	FUSIBLE	0.22	10%	1/4W
R542	1-249-429-11	CARBON	10K	5%	1/4W	R774	△1-219-136-11	FUSIBLE	0.22	10%	1/4W
R543	1-249-424-11	CARBON	3.9K	5%	1/4W	R775	△1-219-136-11	FUSIBLE	0.22	10%	1/4W
R544	1-249-418-11	CARBON	1.2K	5%	1/4W	R776	1-249-413-11	CARBON	470	5%	1/4W
R545	1-249-428-11	CARBON	8.2K	5%	1/4W	R801	△1-249-482-11	CARBON	4.7	5%	1/2W F
R546	1-249-429-11	CARBON	10K	5%	1/4W	R802	1-249-425-11	CARBON	4.7K	5%	1/4W
R547	1-249-405-11	CARBON	100	5%	1/4W	R803	1-249-425-11	CARBON	4.7K	5%	1/4W
R548	1-249-405-11	CARBON	100	5%	1/4W	R804	1-249-426-11	CARBON	5.6K	5%	1/4W
R549	1-249-405-11	CARBON	100	5%	1/4W	R805	1-247-856-00	CARBON	11K	5%	1/4W
R550	1-249-405-11	CARBON	100	5%	1/4W	R806	1-249-425-11	CARBON	4.7K	5%	1/4W
R551	1-249-405-11	CARBON	100	5%	1/4W	R807	△1-249-482-11	CARBON	4.7	5%	1/2W F
R552	1-249-405-11	CARBON	100	5%	1/4W	R808	1-249-425-11	CARBON	4.7K	5%	1/4W
R553	1-249-429-11	CARBON	10K	5%	1/4W	R809	1-249-425-11	CARBON	4.7K	5%	1/4W
R554	1-249-429-11	CARBON	10K	5%	1/4W	R810	1-249-426-11	CARBON	5.6K	5%	1/4W
R556	1-249-428-11	CARBON	8.2K	5%	1/4W	R811	1-249-429-11	CARBON	10K	5%	1/4W
R557	1-247-856-00	CARBON	11K	5%	1/4W	R812	1-249-425-11	CARBON	4.7K	5%	1/4W
R558	1-249-397-11	CARBON	22	5%	1/4W	R813	1-249-429-11	CARBON	10K	5%	1/4W
R559	1-249-407-11	CARBON	150	5%	1/4W	R814	1-249-429-11	CARBON	10K	5%	1/4W
R560	1-247-856-00	CARBON	11K	5%	1/4W	R815	1-249-429-11	CARBON	10K	5%	1/4W
R561	1-249-428-11	CARBON	8.2K	5%	1/4W	R816	1-249-429-11	CARBON	10K	5%	1/4W
R562	1-249-432-11	CARBON	18K	5%	1/4W	R817	1-249-429-11	CARBON	10K	5%	1/4W
R563	1-249-397-11	CARBON	22	5%	1/4W	R818	1-249-429-11	CARBON	10K	5%	1/4W
R564	1-249-407-11	CARBON	150	5%	1/4W	R819	1-249-429-11	CARBON	10K	5%	1/4W
R565	1-249-432-11	CARBON	18K	5%	1/4W	R820	1-249-429-11	CARBON	10K	5%	1/4W
R566	1-247-887-00	CARBON	220K	5%	1/4W	R821	1-249-429-11	CARBON	10K	5%	1/4W
R567	1-247-887-00	CARBON	220K	5%	1/4W	R822	1-249-429-11	CARBON	10K	5%	1/4W
R568	1-249-407-11	CARBON	150	5%	1/4W	R823	1-249-429-11	CARBON	10K	5%	1/4W
R569	1-249-422-11	CARBON	2.7K	5%	1/4W	R824	1-249-405-11	CARBON	100	5%	1/4W
R572	1-249-429-11	CARBON	10K	5%	1/4W	R825	1-249-405-11	CARBON	100	5%	1/4W
R573	1-249-439-11	CARBON	68K	5%	1/4W	R826	1-249-405-11	CARBON	100	5%	1/4W
R575	1-249-429-11	CARBON	10K	5%	1/4W	R827	1-249-405-11	CARBON	100	5%	1/4W
R576	1-249-429-11	CARBON	10K	5%	1/4W	R828	1-249-405-11	CARBON	100	5%	1/4W
R583	1-249-417-11	CARBON	1K	5%	1/4W	R829	1-249-405-11	CARBON	100	5%	1/4W
R584	1-249-437-11	CARBON	47K	5%	1/4W	R830	1-249-405-11	CARBON	100	5%	1/4W
R587	1-249-437-11	CARBON	47K	5%	1/4W	R831	1-249-405-11	CARBON	100	5%	1/4W
R701	△1-212-861-11	FUSIBLE	15	5%	1/4W F	R832	1-249-405-11	CARBON	100	5%	1/4W
R702	1-249-436-11	CARBON	39K	5%	1/4W	R833	1-249-405-11	CARBON	100	5%	1/4W
R703	1-249-439-11	CARBON	68K	5%	1/4W	R834	1-249-405-11	CARBON	100	5%	1/4W
R751	1-249-421-11	CARBON	2.2K	5%	1/4W	R835	1-249-425-11	CARBON	4.7K	5%	1/4W
R752	1-249-425-11	CARBON	4.7K	5%	1/4W	R836	1-249-417-11	CARBON	1K	5%	1/4W
R753	1-249-437-11	CARBON	47K	5%	1/4W	R837	1-249-435-11	CARBON	33K	5%	1/4W

Note: The components identified by mark △ or dotted line with mark ▲ are critical for safety.  
Replace only with part number specified.

## RECT.

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark
R838	1-249-435-11	CARBON	33K	5%	1/4W			< THERMISTOR >	
R839	1-247-903-00	CARBON	1M	5%	1/4W				
R840	1-249-429-11	CARBON	10K	5%	1/4W	TH501	1-202-855-00	THERMISTOR (POSITIVE)	
R841	1-249-405-11	CARBON	100	5%	1/4W			< TEST PIN >	
R842	1-249-405-11	CARBON	100	5%	1/4W				
R843	1-249-405-11	CARBON	100	5%	1/4W	TP1	* 1-535-115-00	TERMINAL	
R844	1-249-405-11	CARBON	100	5%	1/4W	TP801	* 1-564-337-00	PIN, CONNECTOR 3P	
R845	1-249-429-11	CARBON	10K	5%	1/4W			< VIBRATOR >	
R846	1-249-429-11	CARBON	10K	5%	1/4W	X801	1-577-358-21	VIBRATOR, CERAMIC	
R847	1-249-427-11	CARBON	6.8K	5%	1/4W				
R848	1-249-429-11	CARBON	10K	5%	1/4W			*****	
R849	1-249-429-11	CARBON	10K	5%	1/4W			MISCELLANEOUS	
R850	1-249-429-11	CARBON	10K	5%	1/4W			*****	
R851	1-249-429-11	CARBON	10K	5%	1/4W				
R852	1-249-413-11	CARBON	470	5%	1/4W	112	1-559-297-32	CORD, POWER (K333ESL:E)	
R853	1-249-412-11	CARBON	390	5%	1/4W	112	1-574-383-11	CORD, POWER (K970ES)	
R854	1-249-410-11	CARBON	270	5%	1/4W	119	1-569-007-11	ADAPTER, CONVERSION 2P (K333ESL:E)	
R855	1-249-436-11	CARBON	39K	5%	1/4W	196	* 1-608-268-00	PC BOARD, ERASE HEAD	
R856	1-249-436-11	CARBON	39K	5%	1/4W	257	1-632-779-11	PC BOARD, FG	
R857	1-249-405-11	CARBON	100	5%	1/4W				
R858	1-249-405-11	CARBON	100	5%	1/4W	F701	1-532-286-00	FUSE, TIME-LAG (2.5A)	
R859	1-249-405-11	CARBON	100	5%	1/4W	F702	1-532-286-00	FUSE, TIME-LAG (2.5A)	
R860	1-249-405-11	CARBON	100	5%	1/4W	HE501	1-543-358-11	HEAD, MAGNETIC (ERASE)	
R861	1-249-429-11	CARBON	10K	5%	1/4W	HRP501	1-543-684-11	HEAD, MAGNETIC (REC/PB)	
R862	1-249-429-11	CARBON	10K	5%	1/4W	M1001	X-3356-638-1	MOTOR (REEL R) ASSY	
R863	1-249-441-11	CARBON	100K	5%	1/4W	M1002	X-3356-604-1	MOTOR (ASSIST) ASSY	
R864	1-249-441-11	CARBON	100K	5%	1/4W	S1001	1-466-238-11	ENCODER, ROTARY	
R865	1-249-441-11	CARBON	100K	5%	1/4W	S702	1-157-009-11	SELECTOR, VOLTAGE	
R866	1-249-441-11	CARBON	100K	5%	1/4W	T701	△1-450-451-11	TRANSFORMER, POWER (K970ES)	
R867	1-249-441-11	CARBON	100K	5%	1/4W	T701	△1-450-453-11	TRANSFORMER, POWER (K333ESL:E)	
R868	1-249-441-11	CARBON	100K	5%	1/4W			*****	
		< VARIABLE RESISTOR >						ACCESSORY & PACKING MATERIAL	
								*****	
RV102	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K			1-465-314-11		REMOTE COMMANDER (K333ESL:E)	
RV103	1-238-011-11	RES, ADJ, CARBON	470			2-181-754-01		COVER, BATTERY (K333ESL:E)	
RV104	1-238-597-11	RES, ADJ, CARBON	1K			1-558-271-11		CORD, CONNECTION	
RV105	1-238-600-11	RES, ADJ, CARBON	10K			* 3-350-465-01		CUSHION	
RV106	1-238-600-11	RES, ADJ, CARBON	10K			* 3-367-121-01		INDIVIDUAL CARTON (K970ES)	
RV107	1-238-600-11	RES, ADJ, CARBON	10K						
RV108	1-238-601-11	RES, ADJ, CARBON	22K			* 3-367-122-01		INDIVIDUAL CARTON (K333ESL:E)	
RV202	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K			3-367-548-11		LABEL, MODEL NUMBER (AE)	
RV203	1-238-011-11	RES, ADJ, CARBON	470			3-752-611-11		MANUAL, INSTRUCTION (English, French, Spanish, Portuguese)	
RV204	1-238-597-11	RES, ADJ, CARBON	1K			3-752-611-41		MANUAL, INSTRUCTION (K970ES: German, Dutch, Swedish, Italian)	
RV205	1-238-600-11	RES, ADJ, CARBON	10K			3-793-481-13		INSTRUCTION	
RV206	1-238-600-11	RES, ADJ, CARBON	10K			4-847-802-00		SCREW	
RV207	1-238-600-11	RES, ADJ, CARBON	10K						
RV208	1-238-601-11	RES, ADJ, CARBON	22K						
RV504	1-241-231-11	RES, ADJ, CARBON	100						
RV505	1-241-231-11	RES, ADJ, CARBON	100						
RV801	1-238-598-11	RES, ADJ, CARBON	2.2K						
		< RELAY >						*****	
RY502	1-515-803-11	RELAY							
RY503	1-515-614-11	RELAY							
		< TRANSFORMER >							
T101	1-433-361-11	TRANSFORMER, BIAS OSCILLATION							
T201	1-433-361-11	TRANSFORMER, BIAS OSCILLATION							

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
<b>HARDWARE LIST</b>			
*****			
# 1	7-682-547-04	SCREW +BVTT 3X6 (S)	
# 2	7-682-562-09	SCREW +BVTT 4X10 (S)	
# 3	7-682-548-04	SCREW, TIGHT, S	
# 4	7-685-870-01	SCREW +BVTT 3X5 (S)	
# 5	7-682-547-09	SCREW +BV 3X6, S TIGHT	
# 6	7-685-645-79	SCREW +BVTP 3X6 TYPE2 SLIT	
# 7	7-682-549-04	SCREW +BVTT 3X10 (S)	
# 8	7-682-147-15	SCREW, TR	
# 9	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
# 10	7-682-560-04	SCREW +BVTT 4X6 (S) (K333ESL:E)	
# 11	7-621-772-10	SCREW +B 2X4	
# 12	7-621-772-70	SCREW +B 2X14	
# 13	7-621-775-10	SCREW +B 2.6X4	
# 14	7-622-205-05	NUT M2 TYPE2	
# 15	7-628-253-00	SCREW +PS 2X4	
# 16	7-628-254-10	SCREW +PS 2.6X6	
# 17	7-671-154-01	STENLESS BALL	
# 18	7-682-648-09	SCREW +PS 3X8	
# 19	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S	
# 20	7-621-255-20	SCREW +BVTT 2X4 (S)	
# 21	7-621-255-35	SCREW +BVTT 2X5 (S)	
# 22	7-685-870-01	SCREW +BVTT 3X5 (S)	



# TC-K333ESL/K970ES

## SONY® SERVICE MANUAL

AEP Model  
TC-K970ES

E Model  
TC-K333ESL

### SUPPLEMENT-1

File this Supplement with the Service Manual.

Subject : The gold type of TC-K970ES has been added.

- The gold type is the same as black type except for the parts as shown in the table.
- Use this manual for servicing the gold-type set.
- Items marked “\*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

page	BLACK TYPE		GOLD TYPE	
	Ref. No	Part. No	Part. No	Description
43	2	3 - 364 - 438 - 21	3 - 364 - 438 - 31	WINDOW, CASSETTE
	4	X - 3362 - 818 - 1	X - 3363 - 490 - 1	KNOB (DIA, 12) ASSY (B), SQUARE
	5	3 - 364 - 475 - 31	3 - 364 - 475 - 41	PANEL, FRONT
	7	4 - 908 - 848 - 01	4 - 908 - 848 - 21	EMBLEM, SONY
	8	4 - 908 - 044 - 11	4 - 908 - 044 - 21	ESCUTCHEON, POWER KNOB
	9	3 - 364 - 444 - 01	4 - 908 - 444 - 11	ESCUTCHEON (L)
	10	3 - 364 - 442 - 11	3 - 364 - 442 - 21	WINDOW, COUNTER
	12	3 - 364 - 443 - 01	3 - 364 - 443 - 11	WINDOW, METER
	13	3 - 364 - 447 - 01	3 - 364 - 447 - 11	ESCUTCHEON (R)
	15	X - 3304 - 959 - 1	X - 3363 - 492 - 2	PANEL (LEFT) ASSY, SIDE
	16	4 - 923 - 474 - 01	4 - 928 - 025 - 41	RING, ORNAMENTAL
	17	3 - 704 - 366 - 01	3 - 704 - 366 - 11	SCREW (CASE) (M3 × 8)
	18	*3 - 350 - 489 - 11	*3 - 350 - 489 - 21	CASE
	19	X - 3304 - 960 - 1	X - 3363 - 493 - 2	PANEL (RIGHT) ASSY, SIDE
	21	X - 3304 - 944 - 1	X - 3363 - 489 - 1	FOOT ASSY
44	51	*3 - 364 - 474 - 01	*3 - 364 - 474 - 12	PANEL (BASE)
	52	4 - 922 - 518 - 11	4 - 922 - 518 - 62	KNOB (TIMER)
	53	4 - 908 - 046 - 01	4 - 908 - 046 - 81	KNOB, SQUARE
	64	X - 3362 - 327 - 1	X - 3363 - 491 - 1	BUTTON ASSY
	70	3 - 364 - 441 - 01	3 - 364 - 441 - 11	BUTTON
	71	3 - 364 - 440 - 01	3 - 364 - 440 - 11	KNOB (L)
	72	3 - 364 - 439 - 01	3 - 364 - 439 - 11	KNOB (R)
45	116	*3 - 350 - 482 - 21	*3 - 350 - 482 - 41	PANEL BACK (K970ES)

English

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Sony Corporation  
Audio Group

# TC-K333ESL/K970ES

**SONY®  
SERVICE MANUAL**

*AEP Model*

TC-K970ES

*E Model*

TC-K333ESL

## CORRECTION-1

Correct your service manual as shown below.

 : indicates corrected portion.

Page	INCORRECT	CORRECT
	<u>Ref No.</u> <u>Part No.</u> <u>Description</u>	<u>Ref No.</u> <u>Part No.</u> <u>Description</u>
58	<u>Ref No.</u> RY503 <u>Part No.</u> 1-515-614-11 <u>Description</u> RELAY	<u>Ref No.</u> RY503 <u>Part No.</u> 1-515-803-11 <u>Description</u> RELAY